POPULAR Computing WEEKLY

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Vol 3 No 45

CBM Mac rival

COMMODORE will now go ahead with its plans to launch a rival for Apple's Macintosh in mid 1985 despite a continuing legal battle with Atari over the ownership of the technology involved.

The Commodore machine is based on the Lorraine — a 256K, 32-bit 68000-based micro — developed by Amiga, a US company which Commodore has been in the process of acquiring for some months. Commodore's purchase of Amiga was completed last week.

The future of the new Commodore machine had been in some doubt since Atari sued Amiga earlier in the year in a dispute over chips — used in the Lorraine — developed by Amiga for Atari. Atari claimed that Amiga did not complete the contract and then offered the chips for sale to third parties.

Now there is confusion over how the sale of Amiga to Commodore will affect the law suit. Steven Greenberg of

continued on page 5▶

Advance — IBM takes action

COMPUTER giant IBM has taken action regarding the Advance 86a and B IBM-compatible micros.

Discussion between Ferranti, manufacturers of the Advance machines, and IBM have been going on for some time, regarding the Rom chips used in the Advance.

IBM claimed that the Advance Rom is a 90% direct copy of the Rom developed by IBM for its PC range. Now an agreement has been reached between the companies involved. A spokeswoman for IBM said, "IBM has concluded that a program in the Advance's Rom is an unauthorised copy of the basic input/output system on the IBM PC. Having been informed of the infringement, Ferranti, Advance and W H Smith the distributors, have all agreed to cease infringements." It now seems likely Advance will alter the 86 micros' Rom chip.

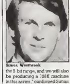
At £1500, the Advance 86b undercuts the basic IBM PC by nearly £1000, while the 86a sells for just £399. The Advance's 8086 processor runs up to 40% faster than the PC's 8088 chip.



Atari plans up-market 800 XL micro

ATARI is to launch a new 128K version of its 800XL computer as well as new 16- and 32-bit micros, in its renewed assault on the micro market.

"The 800XL, now selling at £169, will be the figurehead of



Simon Westbrook

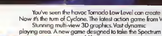
the 8 bit range, and we will also be producing a 128K machine in this series," confirmed Simon Westbrook, Atari Corporation (UK)'s managing director.

"Then we will be introducing 16-bit and 32-bit machines, as talked about by Sam Tramiel earlier this year, which will involve much superior technology. Software for these will be both for business and domestic purposes." These up-market machines are expected to be 68000 processor based.

Atari is planning to offer a range of hard disc units with the more sophisticated machines, up to an IBM-compatible level. The company will also continue to support the lower, end of the market.

INSIDE) Exclusive — win a Sinclair ZX Spectrum +)

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Vol 3 No 45

POPULAR Computing WEEKLY

) View

Last week one amateur Commodore 64 hacker succeeded where our government has so far failed He lifted the exchange rate to $50 to the pound.

Actually what he did was to use his modem to break into the *Financial Times'* reserved pages on the Prestel database and change the information displayed on the system as a joke He also, while he was at it, gained access to the private mail Prestel area used by Prince Philip
break in — apparently without too much difficulty — is considerably embarrassing for Prestel (and just when Prestel bashing seemed to be going out of style, too), especially as Prestel has recently embarked on a campaign to persuade big companies to take system space on which to store their own confidential business information.

Under this government's controversial Data Protection Act it is the responsibility of each database to ensure that its confidential information on individuals is kept as secure as possible. Anyone whose personal details are wrongfully disclosed can go to court to claim damages against the data provider Taking action against the hacker is not easy, however, under present law

It must only be a question of time now before here are professional hackers — experts who, for a fee, undertake to pick open data files as directed and pull out financial data police records or people's credit ratings and political allegiances

There should be big fines imposed for such 'professional hacking And databases carrying private information on individuals should evolve systems to detect if an unauthorised access to the system has been made

) Presents...

) Futures...

Data filing program for the Amstrad .. on-screen printing without control characters on the 64

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How to submit articles Articles which are submitted for publication should not be more than 2000 words long The articles and any accompanying programs should be original It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

Computer Trade Association Magazine of the Year



is better than Jet Set Willy?

Who says so?

Computer and Video Games
It would be unfair to compare this game with Jet Set Willy but as people will inevitably do this I'd like to say I think it is better. Here at C&VG we liked it so much **that we are sticking it in our Hall of Fame**

Crash
Pyjamarama has some of the best animation and realistic graphics I have ever seen Pyjamarama is unbeatable

Personal Computer News
Pyjamarama has what is probably the most stunning graphics you are likely to see on a Spectrum. Pyjamarama is probably one of the best ever games released for the Spectrum

Personal Computer Games
Game of the Month
It's not just the graphics although these are outstanding **The real point about Pyjamarama is that it's the first Arcade Adventure which is a real adventure**. Coupled with the games superb graphics and easy playability means that most people will fall in love with it straight away

So now you know don't ya

Signed *Wally Week*

Spectrum 48K
Commodore 64K
Amstrad CPC464

Mac rival

continued from page 1

Commodore US commented last week: "All the Atari lawsuit has done is prevent Amiga from licensing its chip technology to any third party — in its sale to Commodore it is not doing that, and the suit makes no difference.

"We will certainly be releasing a machine based on Amiga's micro under the Commodore name. A date has not been announced yet, but it will probably be some time in the second quarter of 1985."

Until Commodore's purchase of Amiga, Atari was hoping that its lawsuit would prevent Commodore from releasing the machine.

Rocky Horror Picture Show game from CRL

CRL, the company which has recently released games based on *War of the Worlds*, *Terrahawks* and *The Magic Roundabout*, is negotiating for a deal to base a computer game on *The Rocky Horror Show*.

"We still have to finalise the deal, but everything is going very smoothly," said CRL's managing director Clement Chambers. "We'll be basing the game around the strange environments in the stage show, with the emphasis on graphical presentation, rather than on the elements of dubious taste in the show itself.

Clement Chambers

"I'm hoping the game will be out in the middle of next year. We'll definitely be doing Commodore and Spectrum versions, and as many others machines as we can manage."

More news on page 8

Sinclair portable

SINCLAIR is developing a new portable computer based on the Spectrum technology.

The machine, which could be available by mid 1985, will be fully software compatable with the existing Spectrum and Spectrum+.

Unlike other portable machines, however, the Spectrum Portable will be battery operated, requiring no external power supply.

"This is one of the many projects in the pipeline, although no definite release date has yet been set," said a Sinclair spokesman.

Research into new types of high-performance batteries is now under way at Sinclair's Metalab development facility. The Metalab team worked with Polaroid on the battery for the Sinclair flat screen tv and is currently working to design the power unit for the Sinclair Electric Vehicle project.

● Among the developments at Sinclair's Metalab is a solid state drive for the QL. This silicon version of the Winchester hard disc drive will run up to 100 times faster than a conventional device.

Low-cost modem

UNICOM has announced a full-feature modem costing only £60.

For the price, which includes postage and packing, Unicom is offering a modem complete with leads, power supply and manuals, which connects to any micro with either an RS232 or RS432 interface. It features auto-answer, and auto-baudrate scan facilities, and operates at a variety of baud rates: 300/300, 1200/1200, 1200/75 and 75/1200. The device also allows one- or two-way simultaneous transmission (full and half duplex).

Software is also available, on Rom at £24, and disc at £12 to give access to a number of networks including Prestel, Micronet and Telecom Gold. It also provides an auto-dial and auto-redial facility, and enables the use of a printer to dump data sent and received.

Unicom's low cost modem. Details from Unicom, 20 Orange Street, London WC2

Tangerine in troubles

TANGERINE, the company which spawned Tansoft and Oric Products International, has hit trouble.

Teknocron Circuits, an Isle of Wight company, has presented a winding-up petition against the company. The petition has caused some surprise, since Tangerine has been largely dormant since Oric and Tansoft became separate entities, and Tandata was bought by Applied Petroleum.

"The petition concerns an argument which has been going on for the last three years," explained Oric managing director Barry Muncaster. "Teknocron made the circuit boards for Tangerine's Tantel Prestel adaptor. The money it says we owe them is around £4000 of outstanding interest.

continued on page 8 ▶

Acorn micro music add-on

ACORN is to launch a music synthesiser add-on for the BBC B at the COMPEC show, beginning on November 13.

Manufactured by Hybrid Technology, the synthesiser plugs into the BBC and also connects with a hi fi system. The user can write and program music on the micro using a specially developed language, which can then be played back through the hi-fi speakers. The synthesiser can also be interfaced with a music keyboard.

Acorn is aiming the synthesiser at the professional market, and it is expected to sell for just under £200.

Other new Acorn products for the BBC set for launch at COMPEC include the languages *Logo* and *Pascal* — *Logo* on Rom at £60 and *Pascal* on both disc (6502 second processor needed) and Rom. A Winchester hard disc and the long awaited 32016 second processor option for the BBC will also be announced.

For the Electron, the Plus 3 disc interface will be making its first appearance.

Prestel to hold inquiry

PRESTEL is conducting a top-level investigation into its security following a bizarre incident in which hackers broke into subscribers' files.

Personal identity codes of subscribers were printed on screen, much to the hackers' delight. They were then able to tamper with the *Financial Times* Stock Exchange news, so that at one point the pound was displayed as being worth $50 and break into the files of stockbrokers Hoare and Govett. They also perused the personal mail of Prince Philip — the Duke of Edinburgh is a Prestel subscriber.

"We are treating this very seriously indeed," said a British Telecom spokesman. "I can confirm that there was a severe lapse in Prestel security for a short while. Our immediate action was to change all the identity codes of our information providers, but we are carrying out a full investigation as to how it happened."

Visions of the future

VISIONS Software has shed its marketing operations and is to concentrate solely on program development

Marketing manager Mike Cowell has left the company and joined CSM (Consolidated Software Marketing) as sales and marketing director CSM has now gained exclusive marketing rights to all Visions products.

"The amount of money Visions needed to market his own games was way beyond its means," explained Mike Cowell. "Future releases written by Visions may or may not carry the Visions name — that has not yet been decided.

Of those future releases, the next titles to be launched will be four games for the BBC B — *Apple Pie*, *Sun*, *Ultron* and one as yet untitled *Q-Bert* style game These should be available within a month at between £6 and £8

ACT — company of the year

ACT, manufacturers of the Apricot range of business computers has received the Business Enterprise Award as Company of the Year

The Business Enterprise Award is sponsored principally by the Institute of Directors, and also by Barclays Bank, Lloyds Bank, the Sunday Telegraph and Henley — the Management College

Tangerine

◄ continued from page 5

"The action won't mean Tangerine will cease to exist — because it'll pay the money"

● Oric's legal action against its distributors Prism is also due to be heard in court this week (see *Popular Computing Weekly* October 4) Oric is suing Prism for £4m made up of several smaller claims but has applied for summary judgment on claims totalling £320,000

"We applied for summary judgment because the £320,000 claim is rock solid and beyond dispute It concerns product that was taken and not paid for, and product which was not taken" Barry said.

Game of the film

GHOSTBUSTERS — The Computer Game is due out later this month, some three weeks before the film on which it is based goes on general release

Produced for Activision by *Pitfall* author David Crane. the game plot follows the film fairly closely The player takes the part of a "ghostbuster", striving to save New York from an invasion of ghosts and evil spirits. The aim is to find, capture and safely store the ghosts out of harm's way Also making an appearance is the huge marshmallow man, a feature of the movie

Ghostbusters will be released initially for the Commodore 64 on disc (£19 99) and cassette (£10 99) and for the Spectrum (£8 99) BBC and MSX versions will follow

Exclusive competition

Win a ZX Spectrum +

Popular Computing Weekly, in association with Sinclair, offers the chance to win a Spectrum + — Sinclair's new Spectrum software compatible micro — worth £179 95 — complete with its six bundled software packs including *Tasword 2, Scrabble, Vu-3D, Make-a-Chip, Chess* and *Chequered Flag*

All you have to do is look closely at Sinclair's current TV advert for the Spectrum + — being shown on Channel 4 and ITV until December — and name the eight Sinclair software programs which are shown on the screens during the advert

If you think you know what the eight titles are, fill in the coupon below together with your name and address and send it off to us at Sinclair Competition, Popular Computing Weekly, 12-13 Little Newport Street London WC2R 3LD

Just in case more than one of you get the eight answers correct there is a tie-break Read the idea for a new Sinclair game and think up a good title for it *You are invited to an isolated mansion as a potential heir to a vast fortune To claim the fortune for yourself you must find and piece together the fragments of a portrait distributed around the cobweb festooned house*

The best game title, with the correct eight titles from the TV ad will win the prize

The judges decision will be final. Entries must reach us by midday on Friday, December 7.

Name ....

Address ....

....

....

1	2	3	4
THE HOBBIT	MATCH POINT		
5	6	7	8

My title for the 'heir to the fortune' game is ....



Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four

The computer's brain barely ticks over

To really stretch it, you need more interesting software programs For example, record keeping, interactive education, stimulating adventure games or word processing

And for those you need peripherals

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory

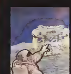
Or a Commodore cassette unit, the inexpensive way of loading and storing programs

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor

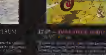


COMMODORE MPS801
Dot matrix printer £230.00.
Tractor feed. Print speed
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Dot matrix printer £345.00
Friction feed for standard
paper Print speed
80 characters per second.
COMMODORE DPS1101
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standard paper Print speed.
18 characters per second.
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charts and graphs Print speed
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commodore

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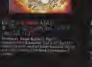



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Written by Simon Finch. You are the ... of a spaceship, trying to rescue h... from destruction by meteors and ... aliens. 100% Machine Code










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No such animal

Your correspondent John Mawhood (*Letters*, October 25 issue) has indeed spotted a documentation bug although I'd like to point out there is no such animal as 'The Amstrad'.

Deci$ is not mentioned in the main user guide and should have been omitted from the technical manual for the Basic, and will be in future editions.

As for the comment "... ought to be publicised because Amsoft have not officially acknowledged it..." What do you want, low-flying aircraft towing banners?

Late delivery of *Amsword* is a considerable nuisance — but exemplifies several cases where software houses anticipated "just transferring" programs from lesser hardware to the CPC464, but ended up by producing a labour of love inspired to far greater things than originally intended by the power of the hardware and OS.

Mr Mawhood will be receiving a beta copy of *Amsword* today, and he may then appreciate why it isn't a simple clone of the Spectrum product. It is a wolf in sheep's clothing, sir — unlike other products which prompt thoughts of mutton dressed as lamb.

And as for having the Spectrum + dangled in front of us — well, really. And the funny thing is that my spies tell me that many programs using the cursor keys on the original Spectrum seem to be exhibiting some trouble coping with the Plus — even though the Rom is reputedly identical. Nice one!

William Poel
Amsoft
Brentwood House
169 Kings Road
Brentwood
Essex

Delete alternative

Here's a quick Amstrad CPC464 bug. If you type in 10 *Rem* and then he *Tab* you end up with the line 10 *Rem* →.

If this is ran you get error messages 'syntax error in 32511' and 'line does not exist in 32511'.

However, things get curiouser. Enter Line 10 → and you get a message 'Line 10 does not exist' so it appears the arrow is ignored.

Now try a small program of ten *Rem* statements. If the first one contains an arrow it deletes all subsequent lines if it is *Run*. *Goto* has no effect.

This then becomes an effective alternative to *Delete*. If you wish to delete the whole program after, say, Line 10000 you can achieve this with 9995 *Rem* →, followed by *Run* 9995. Interesting, eh!

D R Halliwell
4 Heatherdale Close
Oxton
Birkenhead

Right-hook comparison

Perhaps someone can enlighten me? How is it that some writers and reviewers say that the MSX standard is the best thing that ever happened to the Z80, while others claim that it is substandard (sub what standard? To the best of my knowledge there ain't been one up to now).

Some of the most vitriolic statements seem to come from the Spectrum diehards coming out of the blue corner swinging with a right and a left, and following through with a right-hook comparison. Which machine really does fare better?

Sound MSX. 3 voices 8 octaves, programmable using a macro music sub-language. Spectrum. 1 squeak.

Keyboard MSX. Full-travel, typewriter style. Spectrum. Squelch sensitive, travel-sick.

Cursor keys MSX. Well placed, easy to use cluster. Spectrum. Errmm. Now which key, oh sorry!

Editor MSX. Full-screen, cursor-controlled. Spectrum. Single line, back to those cursed cursor keys.

Colour attribute problems MSX. Two colours per eight pixels (horizontal). Spectrum (and C64 for that matter). Two colours per 64 pixels (chunky, man!)

Joystick ports MSX. Two D-ports. Spectrum. What joystick port?

Sprites MSX. Thirty-two. Spectrum. If you buy *White Lightening*. (Commodore 64. Eight but who can control them?)

Real-Time Interrupts MSX. Eight. Spectrum. None.

Need I go on? If MSX is sub standard, what does that make the Spectrum? If MSX is out-of-date because of the Z80 chip it is based on, what is the Spectrum based on, a 32 bit wonder! It is not.

All I'm saying chaps is that the Japanese have made a good job of their standard. Their machines are easy to use, well made, well laid-out, and use a more than passable version of Basic (OK so the Enterprise's Basic is better, but I think that this venerable machine must have been got-at by those nasty Klingons).

And the Japanese companies have done what we should have done two years ago — they got together! We the punters are the winners or we will be if we take little notice of the misinformation which is circulating in certain periodicals.

Mr D A Austin
18 Stafford Avenue
Clayton
Newcastle-U-Lyme
Staffs ST5 3BN

What you have not mentioned in your evaluation of the MSX system is that, whereas the Spectrum is £129 and the Commodore 64 is £199, the majority of the MSX machines cost over £275, and they all have considerably less memory available to Basic than either the Spectrum or C64.

Search in vain

Melbourne House say in the booklet which accompanies their excellent adventure game *Sherlock* 'you will find yourself in strange situations'.

They were right. I had been searching in vain for some time for Major Percival Foulkes when, on returning to Baker Street, I found him in a hansom cab in my hall! I have since tried to remove him and the cab from the hall without success.

A small bug in an otherwise first-class game.

P Cowley
148 Widney Lane
Solihull
W Midlands

More practice

Jeff Naylor's review of the Spectrum+ in the October 25 issue refers to a 'bug' in the new welcome tape. The keyboard tutor program will tell you that you need more practice even when you score 100% if you have spent insufficient time in any section. At least four correct keystrokes are required to get a pass mark.

As you are allowed to leave any section at any time, we decided that 'you need more practice' was an appropriate message for those who leave a section precipitously. Regard it as a bug if you will, but it is a deliberate one.

Incidentally, both the welcome tape and the new manual were designed for a much younger user than the original Spectrum items. Sinclair have thought that most Spectrum users, who are in the eight to 15 age group, may have found the original manual heavy going. After all, Sinclair did not envisage the Spectrum being used primarily for entertainment when it first appeared. It was thought in the beginning that it would be used by small businesses and in education.

Goldstar Software were specifically required to replace the original items with brighter, more easily understood and friendlier productions, omitting the more esoteric technicalities and maybe even some of the less esoteric ones.

Iolo Davidson
Goldstar Software
1-2 Henrietta Street
London WC2


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Dragon Slayer

Rid the land of ferocious dragrons armed with only a sturdy bow, in this arcade game by Richard Snowdon for the QL

Many years ago when dragons roamed the forests, a typical day's work may have involved ridding the land of herds of ferocious dragons But this is no easy task, as the dragons are devious, and powerful and will soon defeat you if you lack concentration

Here the QL becomes your own personal hunting trainer to tune up your reflexes A direct hit is required to destroy a dragon, but plan your attacks well, as you have only six arrows. Once this stock is depleted, you must venture across the river and enter the castle to re-stock

Use the cursor keys to move, and the *ALT* key to fire To enter the castle, stand just in front of the castle door and step inside when it opens.

```
10 REMark    Dragon Slayer
20 REMark       *SnowSoft*
30 REMark   Richard Snowden
120   movemet
130   readchars
140   castle 200 166
150   door 300,166 5
160   lake
170   in t
180   play
190 STOP
200 DEFine PROCedure castle(x y)
210 WINDOW #1,465 ,10 32 , WINDOW #0 465 96 32 ,10 BEEP
    FOR  =0 TO 2 BORDER #i 1,0 SCALE #1,150 0 0 INK
220 7 PAPER #1,0 CLS #1 OVER #1,0
230 MOLE 0
240 LINE   y INK 2 FILL 1 LINE R 50,0 TO 0 40 TO -50,0 TO 0,-40
250 INK _ 1 FILL 1 LINE_R 0 40 TO 10 5 TO 50 0 TO -10 -5
260 INK _ 0 FILL 1 LINE_R 10 10 5 10 0  40 TO  10 -5 10 0 40
270 INK 3 FILL 1 LINE    y
280 LINE R 3 1) TO 0 ,0 TO 3 5 TO 3  0 TO 0  20 TO  6 0
290 FILL 1 LINE x+30 y LINE R 3 10 TO 0,20
 1 3 5 TO 3  0 TO 0  20 TO  6 0
300 INK 3 FILL 1 LINE x y LINE_R 0 40 TO 5,10 TO 5 -10 TO -10,0
310 INK 3 0 FILL 1 LINE R 5 10 TO 10.5 TO 5,-10 TO -10  5 TO  5 10
320 INK   FILL 1 LINE x+30 y LINE R 0 40 TO 5 10 TO 5  10 TO  10 0
330 INK   0 FILL 1 LINE_R 5 10 TO 10 5 TO 5 -10 TO  10 -5 TO  5 10
340 FILL 0 OVER  1 CSIZE 3 1 CSIZE #0 0,1 OVER #0 1
350 FOR    10 TO 0 STEP -2 INK #0 1+(0(x+0) CURSOR #0,
    10     PRINT #0  #L Dragon Slayer
360 OVER #0 0 END DEFine
370 DEFine PROCedure door(x y colour)
380 LINE x+25 y OVER 0 INK colour FILL 1
390 LINE_R  10 0 TO 0 30 TO 10.5 TO 10, 5 TO 0  30 TO -10 0:OVER -1
400 END DEFine
410 DEFine PROCedure init
420 x=20 y=150 dirn=33 f x=300 fy=50 lives=4 dras=-1
430 dx 270 dy 60 ws=37 fire=0 w r=6  nc=0
440 END DEFine
450 DEFine PROCedure play
460 knight x y dra dx,dy ws arrow
    lives left lives left drasleft
470 REPeat loop
480 k=KEYROW(1)
490 IF k&&2  IF   0 THEN knight x,y x=  0 dirn=35 knight x y
500 IF k&&16  IF x 420 THEN knight x,y x= +5 dirn=33 knight x y
510 IF k&&4  IF y 0 THEN knight x,y y=y 0 knight x y
520 IF k&&128  IF y 190 THEN knight x y y=y+0 knight x y
530 IF KEYROW 7&&4  IF arr>0  IF NOT fire THEN fire=1
    x fy y fx 10*(d rn=33)-10*(dirn 30  in
    dirn=33 arr=arr 1 arrowsleft a row fx fy BEEP 0,10 -2,100  2,100
540 IF f re  IF fx 10 OR fx 420 THEN f re=0 arrow fx fy fx=330 fy
    50 BEEP ELSE arrow fx,fy fx=f
550 IF f x dx=50  IF fx dx  IF fy dy 10  IF fy dy+10 THEN bump
    d  dy 4 drasleft
560 IF arr=0  IF y<00  IF  >325 AND < 334  IF y 40 THEN door
    300 166 0
570 F arr 0  IF y<72  IF y 60  IF  326 AND x 334 THEN arrow
    knight x y x=20 y=150 door 300,166
    5 knight x y arrowsleft FOR s 255 TO 10 STEP -1 BEEP 16000-a-
    255 900  255 900
580 r dat(x,y)
590 IF r THEN bump   y,1 livesleft
600 IF fire  IF dy y 10  IF dy<y+10 THEN dra dx dy ws dy (dy+21 0
    dy 120) dra dx,dy ws
610 IF RND(40) 5 THEN
620 IF fire THEN arrow fx fy
630 breath dx dy dra dx dy ws
640 IF dx>x THEN ws=37 dx=dx 0
650 IF dx x THEN ws 42 dx=dx-+30 (dx^360)
660 IF dy>y  IF dy 10 THEN dy=dy 0 IF dat(dx+
    ws+42) 440,dy) THEN dy=30
670 IF dy<y THEN dy dy+  IF dat(d   ws 42) 440 dy) THEN dy=130
680 dra dx dy ws
690 IF fire THEN arrow f  fy
700 END IF
710 END REPeat loop
720 END DEFine
730 DEFine PROCedure arrow(x y)
740 INK 3 CURSOR x y PRINT CHR$(180+inc)
750 END DEFine
760 DEFine PROCedure arrowsleft AT #0,0 20 PRINT #0 "Arrows
    FOR s=1 TO arr PRINT #0 CHR$(169)
770 CLS #0 4 END DEFine
780 DEFine PROCedure breath(bx,by)
790 LOCal w,r
800 BEEP 10000 255  200 ,0  300 20 3 0
810 IF ws=17  w=RND(40) ws=p bx  w=bx-p  ELSE p bx+50 w=RND
820 10 440)-p IF w>p THEN w=440-p
830 IF by 20  IF by 72  IF w<370  IF w<r 7
    THEN w=300 p w+w (p+50)
840 BLOCK w 40 p by 10 2 0
850 IF x  w  IF x p+w  IF y by-30  IF y<by+30
    THEN bump x y 2 livesleft
860 BLOCK w,40 p by-10 2 0
860 IF fire THEN BEEP 0 10  2 100
870 END DEFine
880 DEFine PROCedure dra(x y,d)
890 INK 4
900 CURSOR x y PRINT CHR$(d) CURSOR x+10 y     
    CURSOR x+20 y PRINT CHR$(d+2) CURSOR
    x+30,y PRINT CHR$(d+3)
910 END DEFine
920 DEFine PROCedure bump(cx cy,colour)
930 LOCal p r,f
940 BEEP 0 2,50.50 50 50,7 7 INK colour
950 LINE cx/440*420,(190-cy)/190*256 FILL 1
960 FOR p=1 TO 7
970 FOR r=1 TO 50 STEP 5 CIRCLE_R 0 0 r
980 FOR r=50 TO 1 STEP -5 CIRCLE_R 0 0
990 NEXT p BEEP
1000 END DEFine
1010 DEFine PROCedure livesleft lives  lives=-1 AT #0 1 16 PRINT #0
    Lives    FOR i=1 TO lives PRI
    AT #0 CHR$(130) NEXT i PRINT #0
1020 knight x y x=20 y=150 knight x y IF lives=0 THEN gameover
1030 END DEFine
1040 DEFine PROCedure drasleft dras=dras+1 AT #0 1 26 PRINT
    #0 "Dragons   dras
1050 dra dx,dy ws dx=270 dy=60 ws=37 dra dx dy ws fire=0 arrow fx
    fy fx=330 fy=50 IF dras=10 THEN gameover
1060 END DEFine
1070 DEFine FuNction dat(dx,dy)
1080 p=131072+(dx+32)* 2530+(2*(dy+2)*180
1090 RETurn PEEK(p)+PEEK(p+1)+PEEK(p+2560)+PEEK(p+2561)
1100 END DEFine
1110 DEFine PROCedure lake
1120 INK 1 FILL 1
1130 LINE 0 100 TO 52,150 TO 43 120 TO 0,130 TO 0 164 FILL 1
1140 LINE 75 105 TO 390,110 TO 390,00 TO 60 125 TO 75,1?0
1150 END DEFine
1160 DEFine PROCedure screen
1170 OVER  1 CSIZE 0 0 BEEP 0 250, 60 100  25 100
1180 FOR i=1 TO 2
1190 FOR p=10 TO 0 STEP  1
1200 AT p p+1 FOR x=p TO 36 p INK    MOD 7)+1 PRINT CHR$(i)
1210 FOR y p TO 14-p AT y,37-p INK (y+3) MOD 6)+1 PRINT CHR$(i)
1220 FOR x=37 p TO p STEP -1 AT 20-p x INK
    (x MOD 7)+1 PRINT CHR$(i)
1230 FOR y=20 p TO p STEP -1 AT y p INK (y
    +3) MOD 6)+1 PRINT CHR$(i)
1240 NEXT p BEEP 0 0  200,200 -200 200 NEXT i BEEP
1250 END DEFine
1260 DEFine PROCedure gameover
1270 AT #0 0 0 CSIZE #0 1 1 CLS #0 BEEP 0 255  60  70  25,100
1280 IF dras=10 THEN PRINT #0  The knight won   PAUSE 50 PRINT
    #0 " this time  ELSE PRINT #0  Th
    e Dragon won   PAUSE 50 PRINT #0   as per usual
1290 PAUSE 50 CSIZE #0 3 1
1300 PRINT #0  Another game (Y/N)   (a=INKEY$(0000)
1310 IF a$== Y  THEN RUN 100 ELSE screen STOP
1320 END DEFine
1330 DEFine PROCedure movemet
1340 set=167722
1350 oldbase=PEEK L(set)
1360 newbase=RESPR(875)
1370 FOR m=0 TO 875 STEP 4
1380 POKE L newbase+m,PEEK L(oldbase+m)
1390 NEXT m
1400 POKE_L set  newbase
1410 END DEFine
1420 DEFine PROCedure readchars
1430 RESTORE
1440 numberofchars=13
1450 FOR char=1 TO numberofchars
1460 READ c charbase=newbase+10+(c-32)*9
1470 FOR dat=1 TO 9
1480 READ d POKE charbase+dat d
1490 NEXT dat
1500 NEXT char
1510 END DEFine
1520 REMark characters in mode 8 need size 3 when defining
1530 DATA 33 24 24 16 52 92 20 24,36 72
1540 DATA 34,24,24,16,52,92,52,24,40,68
1550 DATA 35,60,40 16 80 116,60 56 72 36
1560 DATA 36,48,40 16 ?E 116,?? 40 40 68
1570 DATA 37 0,16 96,16,104,4 4,0,0
1580 DATA 38 0 0 4 24 40 64 64,80,12
1590 DATA 39 0 40 84 0 0 0 0 0 124
1600 DATA 40,0 0 68 44 60 56,32 32 64
1610 DATA 41 124 68 84 84 84 84 84 68 124
1620 DATA 42,0 0 68 72 104 120 120 8 4
1630 DATA 43 0 40 84 0 0 0,0 124
1640 DATA 44 0 0 112 0 0 4 0 40 64
1650 DATA 45,0 16 12,16  4 96 64 0,0
1660 DEFine PROCedure knight(x y)
1670 INK 7 CURSOR x y PRINT CHR$(dirn+x/8 MOD 2)
1680 END DEFine
```

Quest for discs

***Christina Erskine** talks to Paul Bygrave from Quest*

The idea of the Sinclair QL as a small business machine has been given a shot of extra credibility with the recent launch of a wide range of business-style add-ons for the machine from Quest International Computer Technology

The Quest QL Executive series (Newsdesk, November 1 issue) includes five floppy disk drives ranging in price from £249 to £599 — single 200K, 400K and 800K and dual 400 and 800K models — a 7 5Mb Winchester hard disc drive at £995 four memory expansion boards from 64K to 512K, microdrive and disc versions of CP/M (£49 50 and £79 50), and Tally, a comprehensive accounts package

Quest's main field of interest, until now, has been in operating systems and Winchester discs for micros in the IBM/Sirius/Apricot range, making their move 'down' to the QL all the more interesting Very much like Sinclair, Quest operates solely on a research and development basis — all manufacturing is sub-contracted.

Paul Bygrave Quest's technical director explained why the QL had caught the company's attention. "Initially we were interested because the QL used the Motorola 68000 processor — we had been aware of the chip's development in the US for some time and its possibilities. The QL's specification made it look like a good machine, and good for items such as Winchesters to run on. We also had the experience to do memory expansions — we felt there was room for an alternative operating system to QDOS, and gradually we progressed to a complete set of packages Judging from Sinclair's record we felt the machine would be a volume seller

"To me, the QL looks like a starter machine with considerable business potential. Perhaps it has been treated with some caution so far because it's not easy to define its market — we're hoping our range will help define one end of it"

Paul joined Quest in March 1984 Previously he and Ralph Warren, now Quest's general manager headed a company named Raw Computers. Raw was sold to Quest Automation and re-emerged as Quest International Computer Technology, part of the Quest group.

The decision to implement Digital Research's CP/M-68K operating system on QL arose from a feeling that CP/M — apart from its large established software base — was more suited to business applications than QDOS

Quest is currently working on a few refinements to the Executive series for the near future one such is a utility to enable data file transfer from QDOS to CP/M. "We want our CP/M system on the QL to be able to co-exist with QDOS — to enable people to go directly from the QL to the type of machine they have in the office." Paul continued "One sector of the market we do envisage using our system on the QL is people working on business at home They will be able to take their data on disc from the QL and feed it straight into their office micro."

Other work in progress includes the facility to allow the floppy disc drives to run 3½ inch and 8inch discs — at the moment they run 5¼ inch only "We chose 5¼ inch to start with because it's the one most people are familiar with — and although we will release a controller board for 8inch, I don't really see it as a heavyweight market"



Quest has been working on the Executive Series since the QL's launch, and have had Sinclair's full support throughout since, as one Sinclair executive put it Sinclair has neither the time nor inclination to manufacture QL peripherals itself

"Sinclair provided all the necessary documentation, and notified us immediately when the new SuperBasic versions came out. We also worked closely with Psion on our *Tally* software packages — we wanted the *Tally* accounts programs to integrate fully with Psion's bundled software As a result, you can take data from *Tally*, load *Easel*, and have your data represented in graphic form without any re-input needed."

Paul is quick to stress that in bringing out a range of floppy disc drives, Quest is not suggesting any inadequacy on the part of the QL's in built microdrives. "I think the microdrives serve a definite purpose, and the Psion packages are very good indeed, but some people will find they simply need the extra space and speed that conventional discs can offer

"Obviously we're aware of the arguments against microdrives, and, yes, we did have some problems with them, but with our range, people can build up slowly to the level they want."

Quest's Executive series will also be made available in its entirety in the US when the QL is launched there early next year "I can see the QL being very successful in the States — they'll see the machine as very much a home micro, but at a fantastic price — much cheaper than an Apple, for example I also don't think the Americans will be quite so critical of microdrives surprisingly enough. I think they'll see them as an exciting novelty — which may not be so good for our floppy discs!'

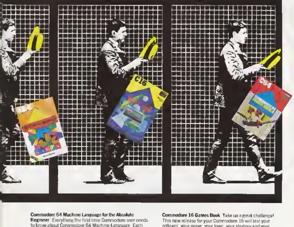
In the long-term, Quest is looking at possibilities for networking and multi-user multi-tasking on the QL "We have an option on Digital Research's concurrent disc operating system which is a system emulating MS-DOS for multi tasking, but this is really looking quite far into the future.

"It takes a very long time to test the system — the writing doesn't take nearly so long, but I can't see anything happening before the second half of next year"

Meanwhile, Quest is still working on its Firefly Winchester disc range for the 'heavyweight' micros — adding the Apricot F1 to the list of machines to carry Firefly and looking at its possibilities on the IBM AT

The QL Executive series however, will form the major focus point of Quest's stand at Compec, the business computer exhibition at Olympia later this month when the series will go on show for the first time to the public.

BOURNE HOUSE!



Commodore 64 Machine Language for the Absolute Beginner Everything the first time Commodore user needs to know about Commodore 64 Machine Language Each chapter includes specific examples of machine language applications that can be used on your Commodore 64 Easy to understand, this book is essential for every Commodore 64 owner wishing to go beyond BASIC

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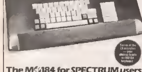
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(This is not a Membrane keyboard)



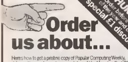
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Reviews

Demo mode

Program *Kensington* **Price** £12.95 **Micro** Commodore 64 **Supplier** Leisure Genius 3 Montague Row London W1H 1AB

Kensington forms part of Leisure Genius's series of micro versions of well-known board games.

Kensington can be used in a number of different modes. The most useful of which enables a solo player to pit his wits against the program which can play at three skill levels — novice, intermediate

Kensington™
PHASE ONE
PLEASE PLACE STONE
ME
HIM

and expert. At the expert level, it proves quite a formidable opponent. The program can also be used by two players using the board displayed on the screen in place of a real one — which seems fairly pointless. Alternatively both players can be played by the computer giving a demo mode.

There are several other options for example, you can control the speed at which the computer makes its moves ranging from too fast to follow to paralysingly slow. You can also watch the program trying out its moves before it selects the best one.

This is a good presentation of an already enjoyable board game, and makes for a handy way for one person to enjoy a game of *Kensington*. The only complaint is that it would have been nice to have been able to use a joystick for control.

Richard Garfield

Overlay

Program *Grasp* **Micro** Amstrad CPC 464 **Price** £8.50 **Supplier** Camel Micros, 33a Commercial Road, Weymouth, Dorset

Grasp is a graph drawing package which will produce variations about three main types of graph: bar, line and pie.

Before you can draw a graph, it is necessary to have the correct data. This data is stored in four 100 element files and can easily be edited. If you want to draw a line graph you must enter the *x*-axis data into one file and the *y* axis data into another. This can be done using the editor, or if the data is linked by a mathematical formula, simply by entering the equation.

A graph of your data is drawn by pressing a single key depending on the graph format to be used. Other functions allow graphs to be overlaid on the screen, texts to be added, and display to be dumped to a printer.

To define your own graph format you have to specify the type, colour, size, position, scaling etc. If you require it, auto scaling can be used.

Overall, *Grasp* is a very good program with extensive facilities which are clearly described in the comprehensive manual. With practice, complex graph formats can be described.

Greg Pearson

Key press

Program *Zedis* **Micro** Amstrad CPC 464 **Price** £6.95 **Supplier** Pride Utilities 7 Chariton Heights, Chariton, Luton LU4 9UF

Zedis is a machine code editor and disassembler for the Amstrad CPC 464. It uses the 80 column display, 40 columns being used for the disassembly, the rest showing the options available and your previous commands.

The commands are limited to those that change the start address of the disassembly, insert a character string or hex digits into memory, move a block of memory, or search memory for a specified 16 bit word.

The disassembly is displayed as a series of pages, each consisting of 24 lines forward or 80 bytes back. The disassembly on the screen can be copied to a printer by pressing the Copy key. This means printing a lot of code requires an equal finger numbing amount of key pressing.

As the program is written in Basic it can't be relocated in memory and use with another Basic routine will require merging of the programs.

If you only require a very simple disassembler/editor then *Zedis* may be sufficient; more than that and it probably won't be good enough.

Greg Pearson

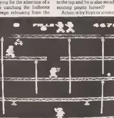
Dumb-bell

Program *Boxer* **Price** £3.95 **Micro** BBC B **Supplier** Acornsoft Limited 4a Market Hill, Cambridge CB2 3NJ

Fast moving action is required to win the heart of the blonde heroine. The scenario is that he-man you and your micro-macho rival are in a gym vying for the attention of a girl by catching the balloons she keeps releasing from the floor. You can catch them only when they lodge in the rafters or beams at various levels. This means you must shin up and down ropes, run to and fro, jump to the balloons — and avoid moving ones as they knock you over.

As if that weren't tough enough you also have to avoid boxing gloves, hammers and dumb-bells that come flying across the screen — not to mention odd things your rival drops on you.

You can punch hammers and gloves if you are fast enough but have to jump dumb-bells. You get points for balloons caught, items punched or jumped. But your opponent gains points if balloons get past you to the top and he is also steadily scoring points himself!



Action is by keys or joysticks with fast smooth animation but curiously little sound. By no means the most original or compelling arcade game based on an overworked 'sense' theme.

Dave Watterson

Slow trace

Program *Assembler and Debugger* **Micro** 48K Spectrum **Price** £9.95 **Supplier** Roybot.

The market for Spectrum Assemblers has become a tough one, and programs have to compete in the areas of testing facilities and special features. Roybot's program scores well on both these counts, and makes up for a slightly non standard line entry and label procedure.

The instructions are entered as Basic *Rem* lines: not an approach I would prefer, but easy to get used to. Labels are not used as such, instead you refer to the line number of the routine to *Call* or *Jump* to. This rules out using a meaningful name for a label, and is something that many programmers will miss. However, the program is easy to use, and different subroutines can be merged together allowing the build up of a library of different subroutines.

The best part of this program is its test facilities. It allows single step or slow trace, showing all registers plus various memory locations. Also included is a fast trace and the use of 'Non Stop Calls', a sort of Express Coach of machine code to use with bits of the program you are sure work properly. The program also maintains a history of the last ten instructions to be executed, allowing some insight into how you got in that endless loop! Also provided are breakpoint, direct entry of instructions and many more, all easy to use.

The only literature provided is the small cassette box insert, but as the program is menu driven this is not an important omission. Roybot's *Assembler* won't be everyone's best buy, but is good enough for most home machine code programmers.

Along with a suitable introductory book, it will give a low cost way in to this more advanced programming language.

Simon Springett

Frenzied

Program *Scuba Attack* **Micro** Spectrum **Price** £6.95 **Supplier** Century Software, Portland House, 12-13 Greek Street, London W1

It can't be easy thinking of new shoot-em-ups but this one contains enough that is novel to make it interesting for those with itchy trigger fingers.

Actually fingers are its major failing — six controls are needed and almost all at the same time. Play can become a tangle of digits.

Meanwhile, on the screen, your submarine defends divers from 'frenzied jellyfish' (frenzied jellyfish — is this for real?). Your laser fires forwards and three sonic bombs can destroy everything in the area, a long range scan completes your equipment.

This results in a fast-moving game — not highly sophisticated in sound or graphics but both are passable — I particularly liked the wobbling whirl of the aforementioned jellyfish.

One hitch is that fresh attackers sometimes appear too close to the submarine destroying it instantly — survival calls for quick reactions at the best of times.

While there is still a market for a basic run-and-shoot game this could sell steadily, though at the moment it is overpriced. A twin-fire programmable joystick would improve the play considerably.

John Minson

Big bug

Program *Pi-in-ere* **Micro** Spectrum **Price** £6.00 **Supplier** Automata UK, 27 Highland Road, Portsmouth, Hants

Arcade freaks watch out for this program in the series featuring Burt, the large nosed cult-figure from Automata.

In this game he is inserted into a computer's innards to search out various bugs and eventually the elusive (well, I didn't find it) Big Bug.

The graphics are very cleverly done — particularly the way the central character turns — and the game uses colour and sound well. The snag is that, even with a joystick (all the usual options are available), the response is far from quick: the little creature takes so long to turn round that the bugs are on him before he can get around to moving away. The game feels impossible at first but you will quickly develop strategies to clear each of the 61 screens — that is if you haven't found anything more interesting to do like listening to *Today in Parliament*.

You see, the truth is that I found this game boring. The sound track on the cassette flip side is quite fun, but totally unsurprising. And I feel the same about the game — it works very neatly but the ideas have all been used many times before.

Simon Springett

Minimal

Program *The Horselord* **Price** £12.95 **Micro** BBC B **Supplier** Century Publishing Co Ltd., Portland House, 12-13 Greek Street, London W1V 5LE

Century bring us a combination novel and arcade game package built round Peter Morwood's sword-and-sorcery book *The Horselord*. The novel is not striking but quite fun with all the standard features of young man making good in a world where all seems set against him. The game is designed by Jonathan Griffiths of *Snapper* and *Rocket Raid* fame. I wish it were even as good as the book.

In fact the action is based on a four page section of the 250 page book. The hero Aldric, takes part in an obstacle

course for horse soldiers. Like a joust it has dummy swords and dyes to indicate strikes rather than blood. The scenario is that as a messenger he must beat the opponents and deliver vital news to the castle In the book something unexpected happens but not in the game

You see the plan view of a course like the @ symbol. Riding up to an obstacle the screen changes to give you a closer view It may be a water jump or more often an ambushing enemy to be destroyed. You may swing at opponents with sword or let loose one of the arrows in your stock It takes five strikes or one arrow to down an enemy swordsman. You play against the clock.

You can use joystick or keys but your actions are limited to turning left or right accelerating and jump/strike or fire arrow The movements are fast but jerky, the graphics chunky, the sound minimal

In short it is boring and a poor way to spend £12.95

Dave Watterson

Unnamed

Program *Shuttle Shock* **Micro** Spectrum **Price** £2.95 **Supplier** Software Supersavers, Bear Brand Complex, Allerton Road, Woolton, Liverpool.

For this, their bargain priced label, Software Projects have stripped packaging to a basic minimum. Gone too are fancy loading screens and elaborate graphics Indeed *Shuttle Shock* resembles a primitive *Manic Miner*

Your character (unnamed — I said this was stripped down) walks left, right or teleports at 45° around a series of platforms Lifts provide some help but accurately judging the teleport leaps is most important.

Inevitably, deadly beasties roam the place on set courses, so timing is vital if you're to reach the exit to the next screen. There is also continuous, infuriating music (although it can be turned off) and the traditional humourous screen titles

As with all games of this type, the fun lies in seeing what comes next, the addictivity in that you only learn what to do by playing

However, I did notice one point in Screen Two, which is rather too harsh in taking a life

The game looks bargain priced but performs well and is a clever not too difficult addition to the platform-maze game family that should suit newcomers. Recommended at the price.

John Minson

Mean streak

Program *Drogna* **Price** £9.95 **Micro** BBC B **Supplier** Acornsoft Limited, 4a Market Hill, Cambridge CB2 3NJ

Based on part of TV's Adventure Game' *Drogna* offers the fascination of a game where the rules change as you play What's more it is one of those rare micro games for two people Strategy, lateral thinking and a mean streak all make a contribution to the winner's skill.

You play on a screen composed of five different shapes each of which may appear in five different colours. You are given a base shape and colour which allows you to move onto any colour in your base shape, or onto any shape in your base colour Think about it! The fun really starts when you learn that on each turn the base shape and colour may change! This system means a colour TV or monitor is essential.

The purpose of your action is to steal diamonds from two stores and transport them to your lair But your larcenous opponent may steal your gems — even the topmost one in your lair and you can do the same to loot or her Strategy is involved in planning your routes, deciding where to park the loot temporarily if you can't move where you want, and in attacking your opponent so as to make them dissolve into the walls and re-materialise at their lair The first to win 900 points worth of diamonds wins

Play is by keys or joystick and as fast as you expect from Acornsoft, though the sound effects are limited As a game it rates far below *Elite* but should entertain younger members of the household and has the advantage of allowing two to play at once

Dave Watterson

Directions

Program *Here and There With The Mr Men* **Micro** Spectrum 48K **Price** £7.95 **Supplier** Mirrorsoft Holborn Circus, London EC1

Mr Reviewer has an educational program featuring his friends, the Mr Men. It contains four games to teach four to eight year olds directions Whoopee!

Mr Reviewer's mental age is five Also Mr Reviewer could never tell his left from his right But there you go Here he has to guide things from his own and the Mr Men's point of view

The first jigsaw game is a bit boring, but making Mr Tickle tickle Mr Grumpy is much more fun. Then a big worm has to be sent up a tree to knock apples into Mr Lazy's mouth. Finally four Mr Men gang up against Mr Tickle on a chess board.

Roger Hargreaves' cartoons transfer well to the micro as those nice Mr Men at Mirrorsoft have shown before A colour television is advised for these games though.

Mr Reviewer thinks that that program should suit the age-group suggested, but youngsters will need guidance

John Minson



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Communicator

Hardware *Touchmaster Pad (plus Multiprint program)* **Micros** Spectrum, Commodore 64, Vic 20, BBC, Dragon 32 and 64 **Price** £149.95 **Supplier** Touchmaster, Kenfig Industrial Estate, Margam, nr Port Talbot.

For those of you who are not able to type, or who dislike doing so, there are many alternative ways in which you can communicate with a computer.

Joysticks, light-pens, touch screens and mice are some of the more common ways of keeping your fingers away from the keyboard.

Now, Touchmaster, the company which has sprung out of the collapsed Dragon Data, provides yet another way.

It has produced what it claims is 'a revolutionary' touch sensitive pad that sits next to the computer. This device (from which the company takes its name) consists of a wedge-shaped plastic case about 15in long and 12in deep, rising from half an inch in height at the front to about two inches high at the back.

Most of the upper surface of the Touchmaster is taken up by an A4-size rubber pad, which forms the communication surface itself.

This pad has a touch resolution of 256 x 256 points, and information about which points have been touched — using a stylus like a ball point pen which is supplied with the package — can be transmitted in serial or parallel form to the host computer via a Din connection at the back. The company so far, is producing versions for the BBC Spectrum, C64, Vic 20 and Dragon 32 and 64. Versions for the Amstrad and MSX are also under development. Micros that already possess a suitable interface, such as the BBC, need only a cable, those like the C64, the Vic20, the Dragon and the Spectrum need an extra interface (which is included in the price).

The Spectrum version has the interface contained in a black plastic box that looks just like a Dragon games cartridge. Apart from the standard connector to the Spectrum, there is a ribbon cable that plugs into the parallel port on the Touchmaster pad. The power comes from a power supply with an integral mains plug and the connections are shown clearly in the documentation which also includes short routines to allow the Touchmaster to be used in your own programs. The proof of the pudding however, lies in using some of the purpose built software for the device — the so-called "Touchware".

Included in the pack is a copy of *Multipaint*, a fairly complex graphics package. As with all Touchware, a plastic overlay is included that fits over the sensitive pad on the Touchmaster. This is blank on most of the surface except for a section about an inch wide down the right-hand edge that is divided into 40 small areas. Pressing these with the stylus controls colour, brush type and width, drawing mode and so on, while the rest of the pad is used as the drawing area.

The software on the Spectrum loads in about two minutes to display a blue screen with a small information area along the base to remind you of the ink/paper colour, drawing mode, etc. A large cross acts as the drawing cursor, and once the brush type and width have been selected, drawing can commence. It takes some time to get used to the fact that your hand is moving in one place while the results are appearing somewhere else, but once you get over that conceptual hurdle, the effects can be quite good. There are brush widths from one pixel up to 32, as well as five different stroke types, and the results can range from fine lines to a sort of air brush stippling effect. There are also *Box*, *Circle* and *Polygon* commands and the usual *Fill* and *Print* routines.

The pad is easy to use and seems only limited by your own graphic ability and of course, the Spectrum's restrictions on colours in the same character square, which produces chunky edges if you aren't careful. My only complaint with the Touchmaster in use lies in finding where you are on the screen, as there is no record of your progress on the pad.

The BBC version of the pad will clearly produce better detail, and if a QL model were to be produced we could look forward to something approaching the electronic paint-box system used by TV companies.

There is also now, a range of software titles available for the Touchmaster pad including board games, adventures and learning packages. The scope for a device like the Touchmaster in early education or with the handicapped must be enormous, as software can be written that does not involve reading or complex muscular skills, merely the recognition of shapes or colours and the ability to touch the pad.

My overall impressions are very favourable, and the Touchmaster would be a very useful peripheral for any computer. However, I don't think it will sell particularly well as long as it keeps its present price. If it cost £60, it would be expensive but worth having. At £145 it is considerably more than you would have to pay for a Spectrum, an Atmos, a Dragon or a Vic 20 or C16.

Much as I like the concept, at the moment you'd get better value from a light pen and you'd also know where you were on the screen.

John Scriven

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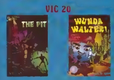






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Elegant

Hardware *Spectrum On-off power switch* **Micro** Spectrum **Price** £4 95 **Supplier** TEC, 24 Victoria Road, Bromsgrove, Worcs.

Peripheral manufacturers have made a good living out of the Spectrum's budget-conscious design. Supplementary keyboards, joystick interfaces and sound boxes by the dozen are available, and it's only with the introduction of the Spectrum Plus and Sinclair's own interfaces that business seems likely to die down.

Meanwhile TEC's Spectrum Switch remedies an abiding problem, by allowing you to switch off or reset your old-style Spectrum without pulling out the mains connector and risking wear on the socket.

The Switch costs £4 95 is designed with breathtaking elegance and simplicity, and adheres to the back of the Spectrum with stick-on self adhesive pad. It clips over the power socket and has a follow-on socket on the back

It's unlikely to fit on any add-on keyboard, but some of these have built-in reset switches anyway

The switch itself seems sturdy and reliable and if you don't have the ability or patience to solder together your own reset switch, you would do well to request Santa to leave one of these in the toe of your stocking

Chris Jenkins

In storage

Hardware Microdrive storage box **Price** £5 95 **Micro** Spectrum & QL **Supplier** Transform Ltd, Swatlands, Lucks Lane, Paddock Wood, Kent

No, contrary to first impressions this is not a box to store microdrives themselves, but a neat holder for the actual cartridges, used on the Spectrum and the QL.

It consists of a black plastic box with internal divisions for holding up to 20 cartridges, and a hinged lid to cover them all. Inside there is also a small gap that can be used for anything, such as the sticky labels supplied with the cartridges, or up to four more cartridges.

When your bank manager lets you buy more than 20 cartridges, you can get an additional box, as they cleverly interlock with one another The cost is reasonable being not much more than a single cartridge

The world (well me mainly) has been crying out for a method of storing the little blighters, and Transform have come up with a neat and cheap way of doing it

Andrew Pennell

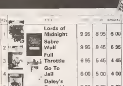




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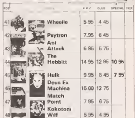
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REVIEWS ...



... Programming tutorials have been ... easy issues ... programming for beginners.

Sinclair speaks

Let your Spectrum do the talking with **John de Rivaz**

This program was developed so that CB users could get their Spectrums to say repetitive messages. The messages are listed in statement lines 380 to 430.

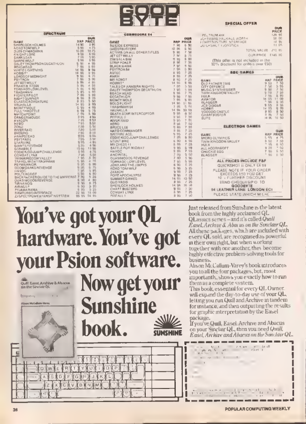
After you have found a blank channel, press "!" and enter the channel number. Then tune your CB to channel 14 and hold the microphone near your Spectrum's speech speaker and press *One* and the microphone key. The Spectrum will say 'One four for a copy'.

When another breaker (ie, CB user) answers usually with 'Break a window' (ie, pick an empty channel), press *Three* and your microphone key, and the Spectrum will say 'Breaker for a copy go to' followed by your chosen channel number. You can press *Four* to get the Spectrum to 'Crank your handle' (ask your contact his CB name) and *Two* to give a count (used to test a link). When you want to talk to your contact, *Five* gives a suitable message.

Program notes

- 10-120 Creates the speech strings which are checksummed by the program. Data line 50 is "oh", "zero" "zero" etc
- 130 Sets the port number to that of your speech unit, which should use the SP028 chip
- 150-180 Checksumming routine for the speech strings
- 190-240 Subroutine that says a string *X$*
- 250-340 Subroutine that says a channel number between 1 and 99 (the program won't *Input* numbers over 40)
- 350-550 The main loop

```
10 CLS : PRINT "CB TALKER (C) RTL 7 JUNE 1984": PRINT : PRINT "Please wait, I'
m thinking."
20 REM CB Talker was made using RTL's Speechwriter, which accepts English Text
 and converts it to allophone strings after asking the user some simple quest-
ions.
30 REM This program (and Speechwriter) is for all speech units using the
SP0256 chip.
40 DATA "A;/(L^('L^(B(NK-O($",1090
50 DATA "DOOKY(A;/(1C(L27(L^(L$L((O&MC((+B+/(W&1(\$/($",2588
60 DATA "cKBMW'L^&W&NK-O&aY&i;($",1411
70 DATA ",K>/M&=^&?>/9b$",899
80 DATA "$&>4&8&[99-+N1K;4'&NK4-U1X(&$&ROD&\D&->[&=U&1;&4$&Y/X($",3068
90 RESTORE 40: FOR n=1 TO 5: READ x$,TEST: GO SUB 150: IF a<>TEST THEN PRINT
"Error in data line ";30+n*10;".": STOP
100 NEXT n
110 RESTORE 40: READ a$,f,b$,f,c$,f,d$,f,e$
120 LET cn=1: REM Default channel number
130 LET PORT=159: REM Set this to your port number.
140 GO TO 370
150 REM SUBROUTINE TO TEST STRING
160 REM ________________________
170 LET A=0: FOR F=1 TO LEN X$: LET a=A+CODE X$(F): NEXT F
180 RETURN
190 REM SUBROUTINE TO SAY X$
200 REM __________________
210 FOR N=1 TO LEN X$
220 IF IN PORT>127 THEN GO TO 220
230 OUT PORT,(CODE X$(N)-36)
240 NEXT N: RETURN
250 REM subroutine to say channel number
260 REM ______________________________
270 LET n$=STR$ cn: IF LEN n$=1 THEN LET n$="0"+n$
280 FOR f=1 TO 2: LET n=VAL n$(f)
290 LET k=0: FOR j=0 TO n-1
300 LET k=k+1: IF b$(k)<>"(" THEN GO TO 300
310 NEXT j
320 LET x$=""
330 LET k=k+1: LET x$=x$+b$(k): IF b$(k)<>"(" THEN GO TO 330
340 GO SUB 210: NEXT f: RETURN
350 REM Main Loop
360 REM _________
370 CLS : PRINT "CB TALKER (C) RTL 7 JUNE 1984": PRINT
380 PRINT "Press to say"
390 PRINT "1.    One Four for a copy"
400 PRINT "2.    Zero to nine count"
410 PRINT "3.    Breaker for a copy goto ";cn
420 PRINT "4.    Crank your handle"
430 PRINT "5.    I am a Spectrum Computer.       I will now pass you to my
 owner"
440 PRINT : PRINT "!     to set channel number"
450 LET x$=INKEY$: IF x$="" THEN GO TO 450
460 IF x$<>"!" THEN GO TO 490
470 INPUT "Channel Number ";cn: IF cn<1 OR cn>40 THEN GO TO 470
480 GO TO 370
490 IF x$<"1" OR x$>"5" THEN GO TO 450
500 IF x$="1" THEN LET x$=a$
510 IF x$="2" THEN LET x$=b$
520 IF x$="3" THEN LET x$=c$: GO SUB 210: GO SUB 250: GO TO 450
530 IF x$="4" THEN LET x$=d$
540 IF x$="5" THEN LET x$=e$
550 GO SUB 210: GO TO 450
```



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Quill, Easel, Archive & Abacus on the Sinclair QL
Just released from Sunshine is the latest book from the highly acclaimed QL QLassics series – and it's called Quill Easel, Archive & Abacus on the Sinclair QL.
All these packages, which are included with every QL sold, are recognised as powerful in their own right, but when working together with one another, they become highly effective problem-solving tools for business.
Alison McCallum-Varey's book introduces you to all the four packages, but, most importantly, shows you exactly how to run them as a complete system.
This book, essential for every QL Owner will expand the day-to-day use of your QL, letting you run Quill and Archive in tandem for instance, and then outputting the results for graphic interpretation by the Easel package.
If you've Quill, Easel Archive and Abacus on your Sinclair QL, then you need Quill, Easel, Archive and Abacus on the Sinclair QL.
SUNSHINE

Printing prettier

Take the strain out of listing with Pretty Prints by ***B G Merrick***

SuperBasic is a powerful language designed for ease of programming. Hence it is perhaps surprising that no facility exists for indenting sections of a program when listed to show its structure, especially considering that this function is provided automatically in the database programming language provided in Archive.

This routine overcomes this deficiency by reading a program file from microdrive (or any other source) and copying it to another device (or back to the same file), formatting it by indenting all multi-line *REPeat* loops, *FOR* loops, *SELect* branches, *PROCedures*, *FUNctions* and *IF* statements as it goes.

In order to use this program, first save the code to be formatted. Then load and run this program. The program prompts for a source and a destination file. The full name including the device should be entered, for example *'mdv1 pretty'* as this provides consistency with SuperBasic commands and allows a file to be formatted to a printer. However, if just *Enter* is pressed in response to the destination file prompt, and the file is on microdrive, this program will just copy the file to a temporary file as the source, delete the original file and use this as the destination file. At the end of the program the temporary file is deleted.

Main Routine

This initially prompts the user to determine the file names to use and if required copies the original file *(Source$)* to a temporary file and deletes the old version.

After opening the files (Lines 240 and 250) the routine enters a loop which terminates when the end of the source file is reached. Within the loop the program reads a line at a time, calling *Num* to strip any leading spaces from the line, and print the line number to the destination file. The variable *Spc* holds the number of spaces to be placed between the line number and the first command of a line. The amount this is to be altered before and after printing the line is held in Before and After respectively. The procedure *Spaces* determines the values of these variables for the line. Line 340 ensures that an error will not occur if a program with incorrect syntax is passed through this program. Line 350 actually prints the line using *Fill$* to provide a string of spaces.

On exit from the loop the channels are closed and if used the temporary file is deleted.

Procedure Num

This routine consists of three parts. The first, Lines 460 to 490 simply removes any leading spaces from the line. The second, Lines 500 to 550 gets the line number and prints this right justified in a space of 5 characters (Line 550).

The final part (Lines 560 to 600) is identical to the first part except this it removes spaces from after the line number.

Procedure Spaces

This section of the program compares the start of a program line with the statements listed in Lines 930 and 940 as data. If a match is found the *For* loop terminates with a value of 1 to 9 in *N*, representing the commands in the *Data* statements. If no match is found *N* contains the value 10 hence the dummy command '*' at the end of Line 940 preventing an error on the tenth *Read*.

Colon is then set to a truth value representing whether the line contains more than one statement by first testing for the presence of a colon and ensuring that this is not the end of the line.

This can then be used to determine whether or not a structure exists in its single or multi-line form.

The routine then switches on the value of *N* to determine the change in spacing for different statements. The only points to note here are that as a multi line structure can start on the same line as an ON or =switch. *Spaces* is called recursively, with the remainder of the line being passed as its parameter. A test for *Then* statement is made in the part that deals with *If*.

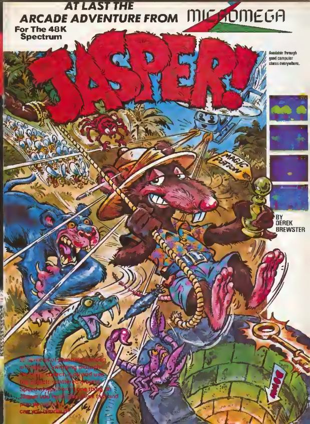
Procedure Diff

This procedure simply updates the values of *Before* and *After* by adding its parameters to them.

```
100 REMark  PRETTY PRINT ROUTINE
110 REMark     BY B G MERRICK
120 REMark       (c)1984
130 REMark
140 INPUT#0,"Source file ? ";Source$\"Destination file ? ";Dest$
150 IF (Dest$='' OR Dest$=Source$) AND Source$(1 TO 3)=="MDV"
160   Dest$=Source$
170   Source$=Source$&'_tmp'
180   COPY Dest$ TO Source$
190   DELETE Dest$
200   temp=1
210 ELSE
220   temp=0
230 END IF
240 OPEN_IN#3,Source$
250 OPEN_NEW#4,Dest$
260 Spc=1
270 REPeat Loop
280   IF EOF(#3) THEN EXIT Loop
290   INPUT#3 line$
300   Num line$
310   Before=0:After=0
320   Spaces line$
330   Spc=Spc+Before
340   IF Spc<0:Spc=0
350   PRINT#4,FILL$(' ',Spc);line$
360   Spc=Spc+After
370 END REPeat Loop
380 CLOSE#3
390 CLOSE#4
400 IF temp THEN DELETE Source$
410 STOP
420 :
430 DEFine PROCedure Num(a$)
440   LOCal n$,i
450   n$='':i=1
460   REPeat loop2
470     IF a$(i)<>' ' THEN EXIT loop2
480     i=i+1
490   END REPeat loop2
500   REPeat Loop3
510     IF a$(i)<'0'OR a$(i)>'9' THEN EXIT Loop3
520     n$=n$ & a$(i)
530     i=i+1
540   END REPeat Loop3
550   PRINT#4,FILL$(' ',5-LEN(n$));n$;
560   REPeat loop4
570     IF a$(i)<>' 'THEN EXIT loop4
580     i=i+1
590   END REPeat loop4
600   a$=a$(i TO)
610 END DEFine
620 :
630 DEFine PROCedure Spaces(l$)
640   LOCal N,Colon,thenin,Stmt$
650   RESTORE
660   FOR N=1 TO 10
670     READ Stmt$
680     IF l$(1 TO LEN(Stmt$))=Stmt$ THEN EXIT N
690   END FOR N
700   Colon=':'INSTR l$
710   IF Colon=LEN(l$) THEN Colon=0
720   SELect ON N
730    =1,2
740     Diff 1,1
750     IF Colon THEN Spaces l$(':'INSTR l$+1 TO)
760    =3 TO 6
770     IF NOT Colon THEN Diff 0,2
780    =7
790     thenin='THEN'INSTR l$
800     IF thenin THEN thenin=LEN(l$)>thenin+4
810     IF NOT(Colon OR thenin) THEN Diff 0,2
830    =8:Diff 2,2
840    =9:Diff 2,0
850   END SELect
860 END DEFine
870 :
880 DEFine PROCedure Diff(a,b)
890   Before=Before+a
900   After=After+b
910 END DEFine
920 :
930 DATA '=','ON','REPeat','FOR','DEFine'
940 DATA 'SELect','IF','ELSE','END','*'
```



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Noises off . . . .

Try using these sound effects to give that professional touch to your programs, from **Mark Gornall**

This program demonstrates seven different sound effects using the *SID* chip. You may look upon them as an example of Commodore 64 sound or you may prefer to use them in your own programs, expanding and improving a particular sound to your own taste.

The program is menu driven, and lets you choose a particular sound or you can play all seven sounds one after the other. You can change the wave form being used, but it should be noted that some sounds may play better in one wave form than another. Here is a short description of each routine.

Sound One plays two notes in a *For/Next* loop but one note is always much higher than the other, giving the effect a rough musical scale. *Sound Two* uses ring modulation of voices one and three to produce a strange sound. *Sound Three* plays random notes but the Sustain/Release is set to give a pleasant effect. *Sound Four* plays two notes in the chosen wave form and two notes of white noise all the way up the scale, using voices one and two. It sounds best in saw tooth wave form. *Sound Five* imitates multiple explosions using all three voices. It sounds best in white noise wave form. *Sound Six* plays two musical scales, one starting at the bottom, playing up, and one starting at the top, playing down, using voices one and two. *Sound Seven* is my favourite. It plays a small echo using voice one and sounds great in all wave forms. You may like to try changing Line 228 to *For=0T040*

I can never make up my mind which sounds best.

Program Notes

Line 2	Set up screen
Line 4	Initialise variables
Lines 6-28	Print menu, check key press
Lines 30-58	Change wave form
Lines 60-238	Sound routines
Line 244	Clear SID chip
Line 248	Set volume and pulse width
S	Voice 1
S1	Voice 2
S2	Voice 3
WV	Waveform
(CLR)	Shift Clr/Home
(CUD)	Cursor down
(CUL)	Cursor left

```
0 REM *** SOUND EFFECTS-MARK
G,1984 ***
2 POKE53280,11:POKE53281,11:POKE646,0
4 S=54272:S1=54279:S2=54286:WV=33
6 C=0:PRINT"[CLR]"TAB(12)
"SOUND EFFECTS"
8 PRINT"[CUD][CUD][CUD]1.
PLAY A SOUND"
10 PRINT"[CUD]2. PLAY ALL SOUNDS"
12 PRINT"[CUD]3. CHANGE WAVEFORM"
14 PRINT"[CUD]4. END"
16 POKE198,0
18 GETA$:IFA$=""THEN18
20 IFA$="1"THEN30
22 IFA$="2"THENC=1:GOTO60
24 IFA$="3"THEN36
26 IFA$="4"THENPRINT"[CLR]":END
28 GOTO18
30 INPUT"[CLR]ENTER SOUND (1-7)
.[CUL][CUL][CUL]";N
32 IFN<1ORN>7THEN30
34 ONNGOTO62,86,110,136,162,192,218
36 PRINT"[CLR]WAVE FORMS"
38 PRINT"[CUD][CUD]1. TRIANGLE"
40 PRINT"[CUD]2. SAW TOOTH"
42 PRINT"[CUD]3. PULSE"
44 PRINT"[CUD]4. WHITE NOISE"
46 GETA$:IFA$=""THEN46
48 IFA$="1"THENWV=17:GOTO6
50 IFA$="2"THENWV=33:GOTO6
52 IFA$="3"THENWV=65:GOTO6
54 IFA$="4"THENWV=129:GOTO6
56 GOTO46
58 :
60 REM ****  SOUND 1  ****
62 GOSUB244
64 POKES+5,88:POKES+6,88
68 POKES+4,WV
70 FORI=0TO200STEP0.5
72 POKES+1,I:POKES+1,I+55
74 NEXTI
76 POKES+4,WV-1
78 IFC=1THEN86
80 GOTO6
82 :
84 REM ****  SOUND 2  ****
86 GOSUB244
88 POKES+1,130
90 POKES+5,204
92 POKES+15,30
96 FORI=1TO300:POKES+4,21
98 POKES+4,WV
100 NEXTI
102 IFC=1THEN110
104 GOTO6
106 :
108 REM ****  SOUND 3  ****
110 GOSUB244
112 POKES+5,9:POKES+6,5
114 FORI=1TO200
116 HF=INT(RND(1)*100)
118 LF=INT(RND(1)*100)
120 POKES+1,HF:POKES+1,LF
122 POKES+4,WV
124 POKES+4,WV-1
126 NEXTI
128 IFC=1THEN136
130 GOTO6
132 :
134 REM ****  SOUND 4  ****
136 GOSUB244
138 POKES+5,8:POKES+6,204
140 POKES1+5,8:POKES1+6,204
142 FORI=1TO100
144 POKES+1,I:POKES1+1,I
146 POKES+4,WV:POKES1+4,129
148 FORJ=1TO5:NEXTJ
150 POKES+4,WV-1:POKES1+4,128
152 NEXTI
154 IFC=1THEN162
156 GOTO6
158 :
160 REM ****  SOUND 5  ****
162 GOSUB244
164 POKES+5,255:POKES+6,204
166 POKES1+5,64:POKES1+6,234
168 POKES2+5,0:POKES2+6,204
170 POKES+1,2:POKES,24
172 POKES1+1,8:POKES,97
174 POKES2+1,67:POKES2,15
176 POKES+4,WV
178 FORI=1TO3000:NEXT:POKES1+4,WV
180 FORI=1TO2000:NEXT:POKES2+4,WV
182 FORI=1TO2500:NEXT:POKES2+4,WV-1
:POKES1+4,WV-1:POKES+4,WV-1
184 IFC=1THEN192
186 GOTO6
188 :
190 REM ****  SOUND 6  ****
192 GOSUB244
194 POKES+5,9:POKES+6,0
196 POKES1+5,9:POKES1+6,0
198 FORI=1TO150
200 POKES+1,I:POKES+1,I+1
202 POKES1+1,151-I:POKES1+1,152-I
204 POKES+4,WV:POKES1+4,WV
206 POKES+4,WV-1:POKES1+4,WV-1
208 NEXTI
210 IFC=1THEN218
212 GOTO6
214 :
216 REM ****  SOUND 7  ****
218 GOSUB244
222 POKES+5,88:POKES+6,204
224 POKES+4,WV
226 FORJ=1TO15
228 FORI=40TO0STEP-1
230 POKES+1,I
232 NEXTI
234 POKES+4,WV-1
236 NEXTJ
238 GOTO6
240 :
242 REM *** CLR SOUND CHIP ***
244 FORI=0TO24:POKES+I,0:NEXTI
246 REM *** SET VOL,PULSE WIDTH ***
248 POKES+24,15:POKES+3,8:POKES+2,0
250 RETURN
```


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Rates of interest

Clear up a few of your financial problems on the BBC B with the help of Neil McGlynn

This program's purpose is to solve problems concerned with social arithmetic — the everyday mundane financial calculations that we all have to make.

It has five functions: simple interest, compound interest, depreciation, rates and Vat.

When the program is executed, the user is confronted with a menu, and is asked to choose which service is required.

The program is well structured and easy to follow, with Rem statements detailing the workings of each procedure.

Program Notes

Procinitialise	Disables *Escape* and *Break* keys
Procmenu	Prints menu on screen
Procscreen	Draws border around menu
Procsimple	Calculates simple interest
Proccompound	Calculates compound interest
Procdepreciation	Calculates depreciation
Procvat	Calculates Vat
Procrates	Calculates local rates
Procend	Ends program
Procagain	Asks for another calculation

The program could be easily developed further to form part of a comprehensive domestic financial program.

```
   1 REM **************************
   2 REM ***    CALCULATOR      ***
   3 REM *** BY NEIL McGLYNN    ***
   40REM *** BBC BASIC          ***
   5 REM *** 1984               ***
   60REM **************************
   70REM The main loop of the program changes
 the mode to a graphics mode and ca
 l = three procedures.
   80REPEAT
   90MODE2
  100PROCinitialise
  110PROCmenu
  120PROCagain
  130UNTILagain$="N"
  140END
  150REM PROCinitialise sets the decimal
 place to 2 places and disables the ESCA
 PE and the BREAK key.
  160DEFPROCinitialise
  170@%=&20209
  180*FX200,3
  190*FX229,1
  200ENDPROC
  210REM PROCmenu removes the cursor from the
 menu and calls PROCscreen which dr
 aws a border around the menu.
  220DEFPROCmenu
  230VDU23;8202;0;0;0;
  240PRINTTAB(2,1);"CALCULATOR MENU"
  250PRINTTAB(2,4);
  260PRINTTAB(2,8);"SELECT NUMBER"
  270PRINTTAB(0,11);" 1 SIMPLE INTEREST"
  280PRINTTAB(0,14);" 2 COMPOUND INTEREST"
  290PRINTTAB(0,17);" 3 DEPRECIATION"
  300PRINTTAB(0,20);" 4 VAT"
  310PRINTTAB(0,23);" 5 LOCAL RATES"
  320PRINTTAB(0,26);" 6 END PROGRAM"
  330PROCscreen
  340REPEAT
  350answer=GET-48
  360UNTILanswer>0ANDanswer<7
  370IFanswer=1THENPROCsimple
  380IFanswer=2THENPROCcompound
  390IFanswer=3THENPROCdepreciation
  400IFanswer=4THENPROCvat
  410IFanswer=5THENPROCrates
  420IFanswer=6THENPROCend
  430ENDPROC
  440REM PROCscreen draws a border
 around the menu.
  450DEFPROCscreen
  460GCOL0,1
  470DRAW1279,0
  480DRAW1279,1023
  490DRAW0,1023
  500DRAW0,0
  510ENDPROC
  520REM All procedures called from the menu
 have the commands VDU22,7 and CHR$1
 41. VDU22,7 changes the mode to the teletext
 mode(MODE 7)and CHR$141 prints the
 character in double height.
  530REM PROCsimple calculates
 Simple interest.
  540DEFPROCsimple
  550VDU22,7
  560PRINTCHR$141;"          SIMPLE INTEREST"
  570PRINTCHR$141;"          SIMPLE INTEREST"
  580PRINT
  590PRINT
  600PRINT
  610INPUT"INPUT PRINCIPAL        "principal
  620PRINT
  630INPUT"INPUT INTEREST RATE    "rate
  640PRINT
  650INPUT"INPUT NUMBER OF YEARS  "years
  660interest=(rate/100)*principal*years
  670amount=principal+interest
  680CLS
  690PRINTCHR$141;"          SIMPLE INTEREST"
  700PRINTCHR$141;"          SIMPLE INTEREST"
  710PRINTTAB(3,7);"PRINCIPAL
 -   principal
  720PRINTTAB( ,9);"INTEREST
 RATE    ;rate" ".
  730PRINTTAB(3,11); YEARS
       - ;years
  740PRINTTAB(3,1 ); INTEREST
    interest
  750PRINTTAB(3,15); AMOUNT
 -   amount
  760PRINTTAB( ,  );"ANY KEY TO RETURN
  770next$=GET$
  780ENDPROC
  790REM PROCcompound calculates
 Compound interest
  800DEFPROCcompound
  810VDU22,7
  820PRINTCHR$141;
 COMPOUND INTEREST
  830PRINTCHR$141;
 COMPOUND INTEREST
  840PRINT
  850PRINT
  860PRINT
  870INPUT"INPUT PRINCIPAL        "principal
  880PRINT
  890INPUT"INPUT NUMBER OF YEARS  "years
  900PRINT
  910INPUT"INPUT INTEREST RATE    "rate
  920amount=principal
  930FORtime=1TOyears
  940amount=amount+(amount*(rate/100))
```

```
950NEXTtime
960interest=amount-principal
970CLS
980PRINTCHR$141;"           COMPOUND INTEREST"
990PRINTCHR$141;"           COMPOUND INTEREST"
1000PRINTTAB(3,7);"PRINCIPAL          = ";principal
1010PRINTTAB(3,9);"YEARS              = ";years
1020PRINTTAB(3,11);"INTEREST RATE     = ";rate%
1030PRINTTAB(3,13);"AMOUNT            = ";amount
1040PRINTTAB(3,15);"INTEREST          = ";interest
1050PRINTTAB(3,23);"ANY KEY TO RETURN"
1060next$=GET$
1070ENDPROC
1080REM PROCdepreciation calculates the
number of years it takes an article to be
worthless and worth half its original value
1090DEFPROCdepreciation
1100REPEAT
1110VDU22,7
1120PRINTCHR$141;"            DEPRECIATION"
1130PRINTCHR$141;"            DEPRECIATION"
1140PRINT
1150PRINT
1160PRINT
1170INPUT"INPUT VALUE OF ARTICLE "sum
1180PRINT
1190INPUT"INPUT % DEPRECIATION    "percent
1200UNTILsum>0ANDpercent>0
1210variable=sum
1220variable2=sum
1230years=0
1240years2=0
1250REPEAT
1260variable=variable-((percent/100)
*variable)
1270years=years+1
1280UNTILvariable<1
1290REPEAT
1300variable2=variable2-((percent/100)
*variable2)
1310years2=years2+1
1320UNTILvariable2<sum/2
1330CLS
1340PRINTCHR$141;"            DEPRECIATION"
1350PRINTCHR$141;"            DEPRECIATION"
1360PRINTTAB(3,5);"ORIGINAL VALUE   = ";sum
1370PRINTTAB(3,7);"% DEPRECIATION
=  ";percent;"%"
1380PRINTTAB(3,9);"NUMBER OF YEARS
FOR ARTICLE S
[illegible] WORTHLESS       = ";y
ears;" YEARS"
1390PRINTTAB(3,14);"NUMBER OF YEARS
FOR ARTICLE S
VALUE TO BE HALVED          = "
years2;" YEARS"
1400PRINTTAB(3,23);"ANY KEY TO RETURN"
1410one t$=GET$
1420ENDPROC
14[illegible]DEFPROC[illegible]
14[illegible]VDU[illegible]
1460PRINTCHR$141;[illegible]
1470PRINTCHR$141;[illegible]
1480PRINT
1490PRINT
1[illegible]PRINT
[illegible]
paid on an article.
15[illegible]INPUT"INPUT THE VALUE OF [illegible]
1[illegible]PRINT
1530INPUT"INPUT THE VALUE OF
THE ARTICLE    "article
1540output=article*vat [illegible]
1550CLS
1560PRINTCHR$141;[illegible]
1570PRINTCHR$141;[illegible]
1580PRINTTAB(3,[illegible]);"[illegible]
= "[illegible]at;"%"
1590PRINTTAB(3,9);"ARTICLE [illegible]
  article
1600PRINTTAB(3,11);"THE [illegible]
THE ARTICLE      "output
1610PRINTTAB(3,2[illegible]);"ANY KEY [illegible]
1620one t$=GET$
1630ENDPROC
1640REM PROCrates calculates the
Local rates to be paid.
1650DEFPROCrates
1660VDU22,7
1670PRINTCHR$141;"         [illegible]
1680PRINTCHR$141;"         [illegible]
1690PRINT
1700PRINT
1710INPUT"INPUT RATEABLE VALUE [illegible]
1720PRINT
1730INPUT"INPUT RATE PER [illegible]
1740rate=rateable*pound
1750CLS
1760PRINTCHR$141;"        LOCAL [illegible]
1770PRINTCHR$141;"        LOCAL [illegible]
1780PRINTTAB(3,7);"RATEABLE VALUE
rateable
1790PRINTTAB(3,9);"RATE PER POUND [illegible]
1800PRINTTAB(3,11);"YOU WILL HAVE
1810PRINTTAB(3,23);"ANY KEY TO RETURN"
1820one t$=GET$
1830ENDPROC
1840REM PROCend ends the program
1850DEFPROCend
1860CLS
1870END
1880ENDPROC
1890REM PROCagain asks the user if he
would like another calculation [illegible]
1900DEFPROCagain
1910VDU22,[illegible]
1920CLS
1930PRINTTAB(3,14);"ANOTHER
CALCULATION (Y OR N)"
1940again$=GET$
1950ENDPROC
```

The dread beast scrolls

The first of three machine-code routines for the Dragon 32 by **Roger Walton**

The Dragon has a poor reputation for lack of quality in its games software. This has often been due to the use of *PMode 4* graphics displays. Although these provide maximum resolution, the user is limited to a two colour display. More recently, programs have appeared using *PMode 3* graphics which are visually more appealing. With careful programming, excellent display becomes possible.

The purpose of this series is to provide a number of machine-code utilities which may be incorporated into programs using *PMode 3*.

PMode 3 requires four pages of graphics memory to display a full screen. The memory set aside for graphics by the Dragon 32 is reserved by the *PClear* command. *PClear 4* is the default value. In normal use, memory addresses *&H0600* to *&H1DFF*, a total of 6144 bytes of Ram, are used by *PMode 3*.

Each point displayed on the screen consists of two bits of memory. This means that each byte will display four points on the screen, giving 4×32 = 128 points per row. There are 192 rows down the screen so the display is 128 × 192 in *PMode 3*.

The bit patterns within a byte determine the colour which is displayed. The following table shows how this works:

bit pattern	colour displayed Screen1 0	Screen 1,1
00	green	buff
01	yellow	cyan
10	blue	magenta
11	red	orange

In the first program a routine is provided which will scroll a section of the screen to the left, two bits at a time. Wrap-around has is to stop should be *Poked* into *&H7F69* (see Basic listing one)
the screen as it disappears from the left. The full width of the screen is scrolled but the vertical height of the section scrolling can be set by the user. This is done by *Poking* the appropriate y-coordinates before *Execing* the routine. The y-coordinate at which the scroll should start needs to be *Poked* into *&H7F68*. The address at which the scroll is to stop should be *Poked* into &H7F69, (see *Basic* listing one)

An example of a use for this program would be to scroll a set of options across the bottom of the screen, as in the excellent *Chuckie Egg* game. A later article will provide a character set for this purpose.

The assembler listing is provided so that you can see how the routine works. The next article will show how to scroll the screen to the right and upwards.

```
10 '  LISTING 1
20 '*******************************************
30 ' SCROLL PROGRAM, R. Walton, July '84   *
40 '*******************************************
50 '
60 ' This program scrolls PMODE 3 graphics left
70 ' across the screen, with
wrap-around built in
80 ' The section of the screen to be scrolled
90 ' is defined by it's X and Y coordinates
which should
100 ' be POKED into &H7F68 and &H7F69 before
EXECing the machine code
110 CLEAR 100,&H7F60
120 FOR LOC=&H7F61 TO &H7FEF
130 READ P$
140 P$="&H"+P$
150 P=VAL(P$)
160 T=T+P
170 POKE LOC,P
180 NEXT
190 IF T<>14274 THEN CLS:PRINT"DATA ERROR":STOP
200 CLS:PRINT"CODE LOADED."
210 PRINT"EXEC &H7F61 TO"
220 PRINT"CALL LEFT-SCROLL"
230 DATA 16,00,0B,06,00,1D,FF,00
240 DATA 8F,00,00,00,00,00,86,20
250 DATA F6,7F,68,3D,C3,06,00,FD
260 DATA 7F,64,86,20,F6,7F,69,3D
270 DATA C3,06,1F,FD,7F,66,BE,7F
280 DATA 64,7F,7F,6A,31,88,1F,10
290 DATA 8F,7F,6D,7F,7F,6B,A6,84
300 DATA 85,80,26,27,85,40,26,2E
310 DATA 68,84,68,84,1C,FE,30,01
320 DATA 8C,7F,6D,2E,05,17,00,23
330 DATA 20,F2,A6,1F,8A,7F,6A,BA
340 DATA 7F,6B,A7,1F,BC,7F,66,25
350 DATA CB,20,2B,34,02,86,02,B7
360 DATA 7F,6A,35,02,20,CE,7C,7F
370 DATA 6B,20,CD,C6,02,F7,7F,6C
380 DATA 1C,FE,68,84,25,07,7A,7F
390 DATA 6C,5A,26,F4,39,A6,1F,BA
400 DATA 7F,6C,A7,1F,20,F0,39
```

Continued over the page

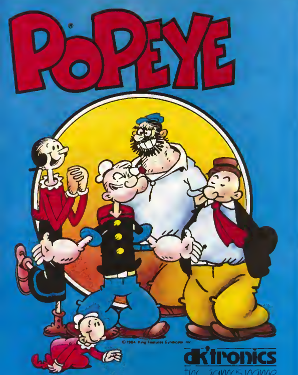
```
7F61                  PRT #0C
7F61           ******************************************
7F61           *                                        *
7F61           *    LEFT SCROLL FOR PMODE 3             *
7F61           *    ROBER WALTON, JULY :'B4             *
7F61           *                                        *
7F61           ******************************************
7F61 160008    @START LBRA @IN
7F64           *****Reserve storage**********************
7F64           @SCRST RMB 2       ;lower scroll address
7F66           DSCREND RMB 2      ;higher scroll address
7F68           @YIN RMB 1         ;lower Y-coordinate
7F69           @YOUT AMB 1        ;higher Y-coordinate
7F6A           @CARRY RNB 3       ;used for wrap-around
7F6D           @LINEND RMB 2
7F6F           *****Calculate screen addresses***********
7F6F           @IN EOU *
7F6F 8620          LDA B32       ;32 bytes/line
7F71 F67F68        LDB @YIN      ;y-coordinate on entry
7F74 3D            MUL
7F75 C30600        ADDD #$600    ;get screen address
7F78 FD7F64        STD DSCRST    ;scroll starts here
7F78 8620          LDA #32
7F7D F67F69        LDB @YOUT
7F80 3D            MUL
7F81 C3061F        ADDD #$61F
7F84 FD7F66        STD @SCREND   ;scroll ends here
7F87           ******************************************
7F87 BE7F64        LDX @SCRST
7F8A 7F7F6A    @GOON CLR @CARRY   ;keep track of bits
7F8D 31881F        LEAY 31,X     ;transferred between bytes
7F90 10BF7F6D      STY @LINEND
7F94 7F7F6B        CLR @CARRY+1
7F97 A684          LDA ,X
7F99 8580          BITA #$80     ;save bit 7
7F9B 2627          BNE @SET
7F9D 8540      @TEST BITA #$40    ;save bit 6
7F9F 262E          BNE @SET1
7FA1 6884      @CONT1 ASL ,X      ;scroll one bit
7FA3 6804          ASL ,X        ;and another
7FA5 1CFE      DCONT ANDCC @$FE   ;clear carry
7FA7 3001          LEAX 1,X      ;point to next byte
7FA9 BC7F6D        CMPX @LINEND  ;if at line end
7FAC 2E05          BGT @WRAP     ;wrap around screen
7FAE 170023        LBSR @SCROLL  ;else keep on scrolling
7FB1 20F2          BRA @CONT     ;do next bit
7FB3           ******************************************
7FB3 A61F      DWRAP LDA -1,X      ;point to last byte
7FB5 BA7F6A        DRA @CPARY    ;in line, setting bits
7FB8 BA7F6B        ORA @CARRY+1  ;if necessary
7FBB A71F          STA -1,X
7FBD BC7F66        CMPX DSCREND  ;is screen done
7FC0 25CD          BLO @GOON     ;if not, continue
7FC2 202B          BRA @OUT      ;else return to BASIC
7FC4           ******************************************
```

```
7FC4 3402          1560 @SET PSHS A
7FC6 B602          1570     LDA #2
7FC8 B77F6A        1580     STA @CARRY    ;used to set bit 2 if neede
d
7FCB 3502          1590     PULS A
7FCD 20CE          1600     BRA @TEST
7FCF 7C7F6B        1610 @SET1 INC @CARRY+1;used to set bit 1 if need
ed
7FD2 20CD          1620     BRA @CONT1
7FD4               1630 **********************************************

7FD4 C602          1640 @SCROLL LDB #2
7FD6 F77F6C        1650     STB @CARRY+2
7FD9 1CFE          1660 @SHIFT ANDCC #$FE ;clear carry flag
7FDB 6884          1670     ASL ,X
7FDD 2507          1680     BCS @COPY     ;copy bit
7FDF 7A7F6C        1690 @BACK DEC @CARRY+2
7FE2 5A            1700     DECB
7FE3 26F4          1710     BNE @SHIFT
7FE5 39            1720     RTS
7FE6               1730 **********************************************

7FE6 A61F          1740 @COPY LDA -1,X     ;take care of
7FE8 BA7F6C        1750     ORA @CARRY+2 ;transfer of bits
7FEB A71F          1760     STA -1,X      ;between bytes
7FED 20F0          1770     BRA @BACK
7FEF               1780 **********************************************

7FEF 39            1790 @OUT RTS
7FF0               1800     END @START
```


POPEYE®
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dk'tronics
the game's name

Open Forum

We are always actively seeking programs for publication — either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation — usually not more than 1000 words — should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Spider Attack

on Spectrum

The object of this game for the 48K Spectrum is to make your way through six levels of a multi-storey maze, collecting boxes of treasure on your way, and finally reaching a magic treasure chest.

Unfortunately your task is hampered by two man-eating spiders which patrol the maze. You carry a gun, but this can only stun them, and firing the gun uses up precious oxygen.

To escape from one level to the next you must simply make your way to the bottom right hand corner of the screen.

The controls are

1 — move left
2 = move right
7 = shoot left
8 = shoot right
9 = jump left
0 = jump right

```
  10 FOR n=USA "a" TO USA "h"+7
 READ a: POKE n,a: NEXT n
  20 DATA 60,126,255,a,a,a,126,6
0
  30 DATA 97,167,157,189,39,35,3
4,4,194,229,185,189,228,195,65,3
2
  40 DATA 60,66,129,165,129,65,6
0,66,129,a,a,a,126,102,231,a,31,
35,69,249,137,138,140,248
  50 DATA 16,16,32,63,32,a,63,0
248,29,28,244,28,24,240,0
  60 LET a$="AAA AAA AA AAAAAAAA
A   AA AA   AAAAA A  AAAAAA AAA
A  AAAA AAAAA  AAAA  AAA AA AAAA
AAA AAAA  AAAAAAA  AAA AAA  AAAA
A  AAA  AAAAAA AAAA  A AAA AAA A
AAA  A AAA  AAAAA AA AAAA A AAA
AA AAA A AA  AAA     AAAAAA AAAA
 AAAAA AAAAAA AA"
  70 DIM b$(6,704): FOR a=1 TO 6
: FOR n=3 TO 21 STEP 3: LET a=IN
T (RND*100)+1: LET b$(a,n*32+1 T
O (n+1)*32)=a$(a TO a+31): NEXT
n: NEXT a
  80 PAPER 6: INK 1: BORDER 1: C
LS : LET li=3: LET ll=1: LET sc=
0: LET sa=20: LET air=20: LET x=
3: LET y=0: LET a=3: LET sb=3: L
ET s1=22: LET s2=27
  90 PRINT b$(ll),AT 21,0;"AAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAA";AT
0,0;"AIR ";AT 0,0;"LEVEL ";AT 0,
18;"SCORE": FOR n=1 TO 12: PRIN
T AT INT (RND*18)+3,INT (RND*32)
; BRIGHT 1;"F": NEXT n
 100 PRINT AT x,y;" ";AT x-1,y;"
": LET y=y+(INKEY$="2" AND y<31
)-(INKEY$="1" AND y>0): IF SCREE
N$ (x+1,y)=" " OR ATTR (x+1,y)=1
13 THEN GO SUB 500
 102 IF ATTR (x,y)=113 OR ATTR (
x-1,y)=113 THEN LET sc=sc+10
 104 PRINT AT x,y;"E";AT x-1,y;"
D";AT 0,4; FLASH (INT air<=2);IN
T air; FLASH 0;" ";AT 0,14;ll;A
T 0,24;sc;AT 0,29;"DDD"( TO li)
 106 PRINT AT a,s1;" ";AT sb,s2
;" "
 108 IF INKEY$="0" OR INKEY$="9"
 THEN GO SUB 1000
 110 LET air=air-.05: LET s1=s1+
(RND>.5)+(RND>.8)-(RND>.5)-(RND
>.8)-(RND>.75): LET s2=s2+(RND>.5
)+(RND>.5)-(RND>.5)-(RND>.5): IF
 s1>30 THEN LET s1=30
 120 IF s1<0 THEN LET s1=0
 130 IF s2>30 THEN LET s2=30
 135 IF INKEY$="7" OR INKEY$="8"
 THEN GO SUB 4000
 140 IF s2<0 THEN LET s2=0
 150 IF SCREEN$ (a+1,s1)=" " THE
N GO SUB 600
 160 IF SCREEN$ (sb+1,s2)=" " TH
EN GO SUB 700
 165 IF ll=6 THEN PRINT AT 20,30
; BRIGHT 1; FLASH 1;"GH"
 167 IF (x=a AND (y=s1 OR y+1=s1
)) OR (x=sb AND (y=s2 OR y+1=s2)
) THEN BEEP .5,-20: GO TO 7900
 170 PRINT AT a,s1;"BC";AT sb,s2
;"BC"
```

Baud Walk

Price war

The price war on modems — predicted in Baud Walk on several occasions — is now showing signs of hotting up with the arrival of the cheapest yet approved 300/300 unit and some price slashing going on in the multi-standard modem arena.

Enter Answercall, best known for their business activities in telecommunications — their *Minimo* modem shipped in from off-shore costs just £75

The modem is very compact it's about half the size of a Spectrum — and comes with a power pack too It has LCD to show when the line has been grabbed or dropped and all in all is a very neat package

The drawback is that Answercall do not offer any software or recommend any software in the enclosed instructions. I would have thought this would have been a natural thing to do given that it's aimed at the home/hobbyist market as well as office automation uses — ie, hooked up to a word processor for telex.

In the multi-standard modem arena, Pace is currently offering its all singing all-dancing Nightingale for £136 85, the cheapest yet

Nothing much appears to be stirring on the bulletin board front but I know of at least one modem company which is planning to bring out bulletin board software to encourage growth of those types of dial-up databases.

About to break in a couple of weeks time is a Channel 4 advertising campaign from Micronet 800 who have been busily arranging demonstration centres so people can see the database before deciding to buy a modem and subscribe to the service.

I understand many Boots stores and some John Lewis and Spectrum Group stores will be offering this facility If you already have a 1200/75 modem with viewdata software you could contact Freephone Prestel and arrange to see a demonstration database from the comfort of your armchair, so to speak

And just a little snippet to keep you hanging on — a major publishing company is about to announce an education network service offering electronic mail and data file exchange possibilities I'm sure *PCW*'s intrepid reporting team will be at the official launch.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking databases reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk *Popular Computing Weekly* 12 13 Little Newport Street London WC2R 3LD

He can also be contacted on Prestel mailbox 019003727

Open Forum

```
180 IF x=20 AND y>26 THEN GO TO 5000
190 IF INT air=0 THEN GO TO 9000
200 GO TO 100
501 LET t=30
505 IF ATTR (x+1,y)=113 THEN LET sc=sc+10
510 BEEP .1,t: LET x=x+1: PRINT AT x,y;"E";AT x-1,y;"D";AT x-2,y;" ": IF SCREEN$ (x+1,y)=" " THEN LET t=t-5: IF t=-10 THEN LET x$="YOU JUMPED TOO FAR": GO TO 8000
515 IF SCREEN$ (x+1,y)=" " THEN GO TO 510
520 PRINT AT x-1,y;" ": RETURN
600 LET s=s+1: IF SCREEN$ (s+1,s1)=" " THEN GO TO 600
610 RETURN
700 LET ss=ss+1: IF SCREEN$ (ss+1,s2)=" " THEN GO TO 700
710 RETURN
1000 IF x=2 THEN RETURN
1002 LET d=1: IF INKEY$="9" THEN LET d=-1
1005 IF (d=1 AND y=31) OR (d=-1 AND y=0) THEN RETURN
1010 PRINT AT x,y;" ";AT x-1,y;" ": LET x=x-3: LET y=y+d: FOR n=0 TO 40 STEP 2: BEEP .03,n: NEXT n
1020 IF d=1 AND y<30 THEN LET y=y+1
1030 IF d=-1 AND y>0 THEN LET y=y-1
1040 RETURN
4000 LET air=air-1: IF INKEY$="7" THEN GO TO 4100
4005 PRINT AT s,s1;"BC";AT ss,s2;"BC"
4010 FOR n=y+1 TO y+10: PRINT AT x,n;"-": IF (x=s AND n=s1) OR (x=ss AND n=s2) THEN FOR j=30 TO 0 STEP -1: BEEP .002,j: NEXT j: PRINT AT s,s1;"  ";AT ss,s2;"  ": LET sc=sc+50: LET s=3: LET ss=3: LET s1=30: LET s2=27: GO TO 4200
4020 IF n=30 THEN GO TO 4200
4030 NEXT n: BEEP .5,-25: GO TO 4200
4100 FOR n=y-1 TO y-10 STEP -1: PRINT AT x,n;"-": IF (x=s AND n=s1) OR (x=ss AND n=s2) THEN FOR j=30 TO 0 STEP -1: BEEP .002,j: NEXT j: LET sc=sc+50: PRINT AT s,s1;"  ";AT ss,s2;"  ": LET s=3: LET ss=3: LET s1=30: LET s2=27: GO TO 4200
4110 IF n=0 THEN GO TO 4200
4120 GO TO 4030
4200 PRINT AT x,0;"                                ": RETURN
REM 32 spaces
5000 LET s=3: LET ss=3: LET s1=30: LET s2=27: LET x=3: LET y=0: CLS: PRINT AT 10,10; FLASH 1; BRIGHT 1;"LEVEL " AND (l<)0,STR$ (l+1) AND l<>0: FOR n=1 TO 3: FOR a=-20 TO 42 STEP 2: BEEP .02,a: NEXT a: NEXT n: LET l=l+1: CLS: IF l<>7 THEN GO TO 90
5005 BEEP .3,24: BEEP .5,20: BEEP .2,21: BEEP .2,23: BEEP .2,24: BEEP .5,30: BEEP .5,30: BEEP 1,25
5010 PRINT AT 10,11; BRIGHT 1; FLASH 1;"BONUS ";(INT air)*100;AT 12,2; FLASH 0;"PRESS ANY KEY TO PLAY AGAIN";AT 14,5;"YOUR SCORE ";sc+((INT air)*100): PAUSE 0: PAUSE 0: RUN
7000 LET x$="GOT BY THE SPIDERS": OVER 1: PRINT AT x,y;"BC": OVER 0
8000 FOR n=0 TO 7: BEEP .1,n*5: PRINT AT x,y; INK n;"E";AT x-1,y;"D": NEXT n: LET x=3: LET y=0: LET li=li-1: IF li=0 THEN GO TO 9000
8010 CLS: GO TO 90
9000 IF INT air=0 THEN LET x$="YOUR AIR SUPPLY RAN OUT"
9010 BEEP .5,10: PAUSE 3: BEEP .3,10: PAUSE 1: BEEP .2,10: PAUSE 1: BEEP .3,10: PAUSE 4: BEEP .3,13: PAUSE 1: BEEP .15,12: PAUSE 1: BEEP .3,12: PAUSE 1: BEEP .15,10: PAUSE 1: BEEP .3,10: PAUSE 1: BEEP .2,9: PAUSE 1: BEEP 1,10: PRINT AT 10,0; BRIGHT 1;"YOU ARE DEAD-PRESS A KEY TO PLAY";AT 6,0; BRIGHT 0;x$: PAUSE 0: RUN
```

Spider Attack
by S Inger

Arcade Avenue



Infinite lives

By the time you read this *Jetset Willy* will be making its, no doubt considerable, impact on the Commodore charts. I understand that it is also being transfered onto the Amstrad. Versions of *Manic Miner* are similarly being prepared for the BBC, Amstrad, Dragon and MSX which must be a huge relief for the non Spectrum owning readers of this column that are wondering what all the fuss is about Miner Willy every few weeks. Even the Vic has its own 16K version of the *Perils of Willy*. Infinite lives pokes will be eligible once the games have been around for a while if you're happier hacking than playing games. (Incidentally I hope all you hackers are rushing to buy System 15000.)

Meanwhile amongst all this flurry of activity from Software Projects, Commodore owners should try to catch a glimpse of the game they licensed from American company Sierra On line — BC's *Quest For Tires*.

From what I've seen it has a disappointingly simple jump, dodge, rescue the helpless maiden plot, but the graphics are wonderful in this they capture almost exactly the nuances of the pictures of cartoonist Johnny Hart (no relation to Tony Hart) who writes the BC comic strip. His cartoons are packed full of inventiveness humour and rich imagery and I am all for them being drawn upon to improve computer games.

Now on to the first couple of letters I have had about Ocean's *Decathlon*. From James Cockings of Sheffield comes this tip

"I started to play this super game in reverse by trying to get the lowest distance I could on the discus. The man did a quarter turn and I threw the discus up at 36 degrees. The discus went up and up till it landed in the crowd and I got 186.86m. (I think you should have got 20 years!) "When I finished the game it restarted again where I left off with three athletes left — infinite lives!

Still with Daley Thompson from Port Glasgow comes what appears to be a syndicate of athlete games players headed by J J Smith.

"My personal best for decathlon is 100 metres, 6 74s, long jump 10 00m, shot put, 33 15m high jump 2 38m 400 metres 27 42m 110 metres hurdles 9 38s pole vault 5 04m, discus, 75 90m, javelin, 132 4m, 1500 metres, 268 11s. Total decathlon score was 716,690 with 493,465 scored on day two

On *Micro Olympics* by Database Publications our record scores are 100 metres 8 04 — self; 200 metres, 16 12 — A. McIntyre and self. Javelin 102 48 m — G Wilkinson and self long jump 8 5 — A. McIntyre G Wilkinson and self; high jump, 2 40 — self

"My other high scores are *Halls of the Things* 726 *Invasion of the Body Snatchers* 4650 *Splat!* 14 665 *Penetrator* 78 430; *3D Ant Attack* 40 844 *Sabre Wulf* 178 000, *Chuckie Egg* 221,000 *Winged Warlords* 14,000 (which caused it to crash); *Full Throttle* 1st place."

Imagine the muscles this guy must have in his fingers!

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12 13 Little Newport Street London WC2R 3LD

Open Forum

Words

on BBC

This is a simple word processor using the mode 7 screen. It is quite easy to operate: you just type whatever you want until you reach the end of the page.

Press shift & to get which prints the screen to a Epson printer

Press shift & to get which saves the screen to tape or disk

Press shift & { to get (which loads a save screen from tape or disk

```
10 REM ************************
20 REM * MACHINE CODE / BASIC *
30 REM * WORD PROCESSOR V 1.0 *
40 REM * BY D C PITHERS       *
50 REM * (C) JUNE 1984        *
60 REM ************************
70 REM
80 CLS
90 DIM GX 500
100 FOR N=0 TO 1
110 P%=GX
120 [OPT 0
130 .wordX
140 LDA £22:JSR &FFEE                 \ SETTING MODE7
150 LDA £7:JSR &FFEE                  \ -----
160 LDA £200:LDX £1:LDY £0:JSR &FFF4  \ DISABLE ESCAPE
170 LDA £12:JSR &FFEE                 \ CLS
180 LDX £0
190 .L
200 LDA DH,X
210 CMP £ASC"*":BEQ SH                \ PRINT TITLES
220 JSR &FFEE:INX:BNE L
230 .SH LDA £13:JSR &FFEE             \ LABLE WITH CARRIAGE RETURN
240 .BS JSR &FFE0:STA &76             \ WAIT FOR INPUT
250 .H CMP £13:BEQ RT                 \ COMPARE WITH 13  BRANCH IF
260 LDA &76
270 CMP £ASC"!":BEQ pr
280 CMP £ASC"":BEQ sa                 \ 3 CMP TO CHOOSE WEATHER TO LOAD
290 CMP £ASC"(":BEQ lo                \ SAVE OR PRINT TO A PRINTER
300 .lp
310 JSR &FFEE
320 JMP BS
330 .pr                               \ PRINTER PROCEDURE
340 LDA £2:JSR &FFEE:LDA £1:JSR &FFEE
350 LDA £22:JSR &FFEE:LDA £1:JSR &FFEE
```

Microradio

GW6JJN

Spot check

Since computers have been around in amateur radio they have mostly been put to use for logging and calculation purposes, as well as for transceiving existing modes of communications such as Morse or RTTY. Many people, myself included, have long argued that this was a waste of the available technology. What is needed is a new and more efficient mode or modes that use computer technology to provide faster, efficient and more comprehensive communication. This has been achieved in two ways. Firstly with *AMTOR* and secondly with the packet radio systems.

This week I shall concentrate on *AMTOR* and a new program for the Dragon which brings it within the range of the ordinary amateur. *AMTOR* to put it very simply, is a highly sophisticated form of Radio Teletype which has handshaking protocols and extensive error checking. One of the great problems with RTTY in difficult conditions is whether the message has actually arrived at its destination. With *AMTOR*'s error checking ability this problem is solved.

AMTOR is an amateur version of an existing system which is used on marine frequencies for weather reports known as *NAVTEXT* and for commercial transmissions known as *TOR/SITOR*. Until now it was quite difficult and expensive to get on the air with *AMTOR*. Thanks to the prolific radio software house Grosvenor Software, it is now possible to use *AMTOR* on the Dragon. If you have a conventional RTTY interface then only a 1KHz clock circuit is required in addition to the software. The clock and/or a full unit is available from PNP.

AMTOR on the Dragon supports three modes of communication, FEC which is like RTTY with less errors, ARQ which is the full *AMTOR* with handshaking and error detection/correction, and a mode called LISTEN which is a monitor mode. As usual with Grosvenor software there is full split screen operation type ahead facility ten user memories and the correct review facility.

A status line continuously displays vital mode and error information and there is a USOS (unshift on space) facility which means that the program always transmits the correct shift after spaces. As usual there is the 24 hour real time clock display which is instantly transmittable.

Dragon *AMTOR* is available on cassette for £39 on disc (Dragon DOS) for £44 and best of all, on *om* cartridge for £49. For people who wish only to listen in on *AMTOR* traffic there is a receive only cassette at £24.

What I find fascinating is that Grosvenor are producing their programs on cartridge which means instant and safe use. They are now offering combinations of their programs in this form as follows: *AMTOR* + RTTY or *AMTOR* + Morse at £80 and *AMTOR* + RTTY + Morse at £69.

When you consider that the Grosvenor programs are probably the ultimate in amateur radio software and remember that the Dragon is retailing around £100 nowadays, then it is beginning to make sense to get a Dragon to use as a dedicated amateur terminal. The total cost with all the interfaces/terminal unit hardware involved is still under £300. Such a possibility was only a dream a year or two ago.

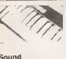
Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share or topics that you would like to see covered, write to Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7LD.

```
360    LDA £51:JSR &FFEE:LDA £1:JSR &FFEE
370    LDA £95:JSR &FFEE
380    LDA £00:STA &70:LDA £&7C:STA &71
390    .AA
400    LDY £00
410    .BB
420    LDA £1:JSR &FFEE
430    LDA (&70),Y:JSR &FFEE
440    INY:BNE BB
450    INC &71:LDA &71:CMP £&80
460    BNE AA:LDA £3:JSR &FFEE
470    JMP DD                              \ END OF PRINTER PROCEDURE
480     .sa LDA£1:STA&75:RTS               \ SAVING PROCEDURE
490     .lo LDA£2:STA&75:RTS               \ LOADING PROCEDURE
500     .RT JSR&FFE7:LDA£10
510    JSR &FFEE:JMP UU
520    .DA
530    EQUS "      "
540    EQUS "Sianns M/C word Processor*"   \ DATA FOR TITLE
550    RTS]
560    NEXT
570    CALL word%
580    IF ?&75=1 PROCSAVE:CALL DD
590    IF ?&75=2 PROCLOAD:CALL DD
600    CALL DD
610    END
620
630
640    DEF PROCSAVE
650    *SAVE "SCREEN" 7C00 FFFF
660    A%=AA
670    ENDPROC
680
690
700    DEF PROCLOAD
710    *LOAD "SCREEN" 7C00
720    A%=BB
730    ENDPROC
```

Words
by S Pithers

The Music Box



Sound synthesis

New products ready for the expected Christmas boom seem to be flooding in mercilessly. Don't worry if you haven't seen any of the goodies yet — this is the computer market, after all, and the practice of early announcement and late delivery has become a tradition.

Perhaps top of anybody's shopping list has to be the Yamaha CX5M. Don't be deceived — this isn't just any old MSX micro. The CX5M is an MSX micro plus what is effectively an entire digital synthesiser complete with keyboard, MIDI interface and Yamaha's DX7/9 hardware and software.

The DX7 and DX9 synths (which retail at around £1500 and £800 respectively) use a new form of sound synthesis based on frequency modulation. Previous systems have either attempted to reconstruct a sound wave numerically (direct synthesis) or have used analogue or digital oscillators, filters and envelope generators to produce a basic sound wave and then process it. FM synthesis uses the fact — long known — that when you combine two different sound waves by frequency modulation, the result will be a whole range of sound waves with different frequencies.

The technical details are elaborate but the system is similar to the one by which VHF radio and the video part of television pictures are transmitted. Since the process is complicated, nobody thought to do it before Yamaha developed their YM2151 chip. The nearest thing to FM synthesis was the production of vibrato — the effect obtained when the frequency of a note varies slightly and rapidly. (It's worth experimenting with vibrato on your micro to see how some interesting effects can be obtained — all you have to do is rapidly change the frequency or pitch of a note in a regular fashion while it's playing.) Digital techniques have allowed Yamaha to develop a set of algorithms for FM which can be relatively simply understood by the non-expert.

The CX5M comes complete with an FM voicing program allowing you to control the YM2151 chip which is contained in a bolted-on unit under the main computer. You get a mini keyboard too but it is very small and the CX5M MIDI doesn't allow you to run the computer from any MIDI keyboard, which is a great pity, especially since cheap MIDI keyboards are now becoming available (the £449 MK900 from Siel, to take a notable example).

Also unavailable is the Music Macro program which, like other CX5M software comes on cartridge (there's no disc-drive at present), and allows you to use the FM system from Basic. For those of us stuck in Basic without FM, the CX5M offers an AY 3 8910 standard MSX programmable sound generator which is hardly compensation.

Still, at around £600 for the package Yamaha seem to have come up with a winner.

Gary Herman

The Music Box is a new weekly column with news, reviews and readers' comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD.

Open Forum

Days

on Spectrum

The Spectrum manual, on page 183, gives a program which converts a date to the right day of the week. This program, however only works for dates of the 20th century. The program below works for any date including other centuries. This is based on the formula V=A mod 7 where A=(2.6m − 0.2) + d + y (y/4)+(c/4)−2c. m is the number of the month (Jan=11 of the previous year, Feb=12 of the previous year, Mar=1, Apr=2 and so on), d=day, y=year and c=(century−1). By *A mod 7* we mean the remainder of *A/7* which, in turn can be found by the formula A mod 7 = A−(7*(*A/7*)) where (*A/7*) is the integer part of *A/7*

Program Notes

20-50	Set the introduction
60	Prompts input of date
70-150	Find value for Y(ear), M(onth), D(ay) and C(entury)
160	Sets value for A
170	Introduces formula
180-250	Finds and prints the right day of the week
260-270	Prompts for another try
280	Stop

```
 10 REM ************************
 11 REM **- DAY OF THE WEEK ***
 12 REM ********* BY **********
 13 REM *** CHARLES BAJADA ****
 14 REM **** 17th MAY 1984 ****
 15 REM ************************
 20 CLS : PRINT AT 0,9,"DAY OF THE WEEK";AT 0,9; OVER 1;"___________"
 30 PRINT AT 2,0;"  This programme gives you the day of the week of any date you may enter. Give the correct dataand let the computer do the restFor FULL DATE enter date in the form 03/04/1945. "
 40 PRINT AT 20,4; FLASH 1;"PRESS ANY KEY TO CONTINUE"
 50 PAUSE 0: IF INKEY$="" THEN GO TO 50
 60 CLS : INPUT "FULL DATE ";D$: PRINT AT 0,12;D$
 70 LET m=VAL D$(4 TO 5)-2: IF m=-1 THEN LET m=11
 80 IF m=0 THEN LET m=12
 90 IF m=11 OR m=12 THEN GO TO 110
100 GO TO 120
110 LET x=VAL D$(7 TO 10): LET y=x-1
120 LET d=VAL D$(1 TO 2)
130 LET c=VAL D$(7 TO 8)
140 LET y=VAL D$(9 TO 10)
160 IF m=11 OR m=12 THEN LET y=y-1
150 LET a=(2.6*m-0.2)+d+y+(INT (y/4))+(INT (c/4))-2*c
170 LET day=a-(7*(INT (a/7)))
180 PRINT AT 5,0;D$;" was is a"
190 IF day>=0 AND day<1 THEN PRINT AT 5,21;"SUNDAY"
200 IF day =1 AND day<2 THEN PRINT AT 5,21;"MONDAY"
210 IF day>=2 AND day<3 THEN PRINT AT 5,21;"TUESDAY"
220 IF day>=3 AND day<4 THEN PRINT AT 5,21;"WEDNESDAY"
230 IF day>=4 AND day<5 THEN PRINT AT 5,21;"THURSDAY"
240 IF day>=5 AND day<6 THEN PRINT AT 5,21;"FRIDAY"
250 IF day>=6 THEN PRINT AT 5,21;"SATURDAY"
260 INPUT "ANOTHER DATE ?",x$
270 IF x$="y" THEN GO TO 60
280 STOP
```

Days
by C Bayada

Book Ends

Book Gateway to Computing Book 1 **Price** £4.95 **Micro** Commodore 64 (Spectrum, BBC, Dragon 32, Electron also available) **Supplier** Shiva Publishing Limited, 64 Welsh Row Nantwich, Cheshire CW5 5ES

Ian Stewart's book is aimed at the young, absolute beginner and is one of three available in versions for a variety of micros.

This first volume introduces many of the major Basic commands, it emphasises the need for careful punctuation and other practicalities, and takes a quick look at the workings of the computer, all in a humorous, informal style.

It uses cartoons, diagrams and many small tests and examples to avoid being dry or daunting. It should provide a firm base for any youngster interested in doing more than zapping aliens, however buying all three parts will prove a costly investment. Recommended, though.

John Minson

Book Commodore 64 Machine Code **Price** £6.95 **Micro** Commodore 64 **Supplier** Shiva Publishing Limited, 64 Welsh Row Nantwich, Cheshire CW5 5ES

To fully exploit the potential of any computer you need machine code, but sadly it is a subject that can make even dedicated programmers quail.

Now Commodore 64 users have Ian Stewart and Robin Jones's excellent introduction to the subject. By breaking it down into byte-sized nibbles (sorry!) they have tamed most of its terrors.

Machine code is primarily concerned with careful manipulation of simple processes, and the authors illuminate the logic of these through many practical examples. Moving from binary and hex numbers to hi-res graphics, and including several hand-assembly aids the book provides a painless grounding for anybody interested in communicating directly with their 64's CPU.

John Minson

Book *The Electron Puzzle Book* **Micro** Electron **Price** £5.95 **Supplier** Sigma Technical Press, 5 Alton Road, Wilmslow, Cheshire SK9 5DY

Written principally with the Electron in mind, this book nevertheless assumes a minimum working knowledge of BBC Basic. Through posing problems and offering alternative solutions, the book aims to develop the serious computer user's ability to solve puzzles and problems in a logical manner. New information is reinforced through a series of graded problems — each concerned with making words, numbers, sounds and graphics.

The book is written in a somewhat 'chatty' style. There are four chapters containing 50 problems with their solutions. All the puzzles require you to produce some result on the TV screen — simple words, random words and numbers, etc. Once these have been solved, the problems are made more complex when they are developed further with graphics and sounds. Not a book for beginners, but good for more serious programmers wanting to learn how to apply programming skills in an interesting and logical way.

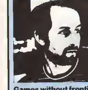
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Tony Bridge's Adventure Corner



Games without frontiers

One of the more amusing pastimes to which I treat myself occasionally, is reading the adverts in the Computer Press (without which) — the prerequisite nowadays for a game to sell well would seem to be either the reward of a disgustingly huge cash prize, or the endorsement of some disgustingly healthy athlete (who has probably never been within five miles of a home computer!) If not one of these two then the program is "The Official" version of some boring TV soap opera or horror film. Because of all this, software houses feel it natural to charge rather more than what used to be the norm for computer games. A price of £6 or so is, I think, not too steep — after that, beware! Programs such as *The Hobbit* and *Elite* (the new spacetrap-management strategy-adventure for the BBC) are exceptions.

It comes as a nice surprise then, to see a small band of software writers clinging to the pioneering spirit of a couple of years ago (remember when Bug-Byte and Quicksilva occupied little trestle tables and sold their software from cardboard shoe boxes?) When Gilsoft released *The Quill* a few months ago, I expressed the hope that programs written with it would stay in the lower price bracket — after all, the hard work has been done by Gilsoft.

The name of 8th Day Software cropped up not long ago in the Corner, and I am pleased to say that they have recently released a suite of six adventures, all written with the aid of *The Quill*, and all costing an incredible £1.75 each.

Like Scott Adams programs, the 8th Day products, which, incidentally, go under the collective name of Games without Frontiers, are graded in terms of difficulty. Thus *Ice Station Zero* is a Beginners Game, *Cuddles*, *Quann Tulla* and *In Search of Angels* are moderately difficult, while only advanced adventurers should tackle *Four Minutes to Midnight* and *Faerie*.

As I've said before, titles are very important in attracting interest in an adventure and these are guaranteed to grab the attention. The beginner's game *Ice Station Zero* is of the standard "get-everything-you-can-and-expore-as-much-as possible" variety, in which you, the player, have to cross the Polar ice-cap in search of Stirling, an international terrorist. *Quann Tulla* places you in the shattered hull of a spaceship deep in space. Eventually, battling against robots and highly advanced computer systems, you are pitted against the might of an evil, corrupt Empire.

In Search of Angles is another James Bond-like romp, while *Cuddles* pitches you straight into the horrors of the nursery, from which you have to escape (lots of chances, here, to throw dishes of sloppy baby food around the place!) *Four Minutes to Midnight* is set in the devastation caused by a bacteriological disaster. Intriguingly, the player has to recruit five other characters to help in our eventual success. The other "Advanced" adventure in this collection is *Faerie*, which is a Midsummer Night's fantasy on the Spectrum, with all kinds of weird creatures, and hoards of fairy gold.

There are no fancy screen layouts, or redesigned character sets here — all the adventures are pretty workmanlike in their execution, all excellent value and guaranteed to give the keen adventurer as well as the beginner, lots to think about. Each game starts off with an artfully-drawn title page to set the atmosphere (for example, *Quann Tulla* opens with a James Blish *City in Flight*) — unfortunately, the old spectre of The Spelling Mistake raises its head every so often. It beats me why, even in inexpensive software, someone isn't made responsible for checking every word.

Quann Tulla, as well as some of the others, displays one of the odd quirks which *The Quill* may be found guilty of, and which the lazy programmer falls foul of — the limited-move syndrome. In many *Quill'd* adventures, this takes the form of "so-many-moves-before-the-player-dies-of-hunger/thirst". This is fair enough, of course, but the anomaly comes after the player has solved this particular problem — it invariably doesn't arise again! Now, this has always struck me as rather silly — after all, if ten (or whatever) moves without food/water is enough to kill you off, why, after satisfying that hunger/thirst, should you then appear invulnerable during the rest of the adventure?

Anyway the present adventure presents this problem as a requirement for the adventurer to discover how to survive in an airless environment — a certain number of moves are allowed before you die of oxygen starvation, and the same number of moves are required to discover the gas mask and put it on. As the little sequence is at the beginning of the game, you can very quickly start again, and gradually eliminate all the wrong moves.

Ice Station Zero is conducted in a similar way — once out of the tent at the start, you are shadowed by a pack of hungry wolves. Make the wrong move, and you are instantly set upon and killed off. The rest of the adventure though, seems pretty logical (for example, you may take your gloves off when warm but you must don them again once outside). A good beginner's game, with lots of atmosphere.

The others in the series are also pretty competent. *Faerie*, one of the Advanced games, is nicely laid-out, with little coloured hearts framing the location descriptions, and rather hard puzzles, too.

Overall, the series of Games Without Frontiers is well worth investigating, even though Eddie Waring himself doesn't get a mention, and despite the fact that the frequent spelling mistakes sometimes lead to the player having to actually mis spell to make the program understand (as in "GET THE BROACH"!) The price excuses this sort of unfortunate lapse, and the atmosphere and logical puzzles in all the adventures makes up for any bad layout — after all, the whole series is still cheaper than some individual programs. And 8th Day provide a complete back up service, with hint sheets and clues. (8th Day Software, 18 Flaxhill, Moreton, Wirral, Merseyside L46 7UH.)

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Peek & Poke



Legal advice

P West of Scarborough, writes

Q **I am writing to ask you for legal advice. I am 15 years of age and my friend is almost 15. We have written several adventure games and are trying to sell them by buying cassettes, recording the tapes ourselves etc. However, we do not know how we stand legally to avoid other people copying our games and what licences or other things we would need to obtain. Could you help us?**

A There are no real legal steps that you can take to protect your software The law as it stands offers little protection. My advice would be to put copyright notices on any loading screens, and also to place copyright notices within your program code Unless you can prove that someone has actually copied your code, there is no action you can take

Screen in motion

Craig Lamble of Paisley, writes

Q **I own a Vic 20 and I was wondering why the whole screen moves when I type 9*16 ↑ 3,8+8.**

Also, is there a chess program available for the unexpanded Vic?

A Are you sure you did not type in *Poke*, etc? Location 36864 (9*16 ↑ 3) is one of the Vic screen pointers so that is why the screen moves when you set it to 16 (8+8)

There does not appear to be a chess program for the unexpanded Vic at the moment, although I'm sure that some wide awake software house will immediately set about writing one now

Ace stockists

Paul Dunlop of Horsley, Glos., writes

Q **I am very interested in buying a Jupiter Ace and I have a few questions to ask.**

Do any retailers still stock the Ace, if so how much?

How many Aces were made before Cantab went bust? What modifications need to be made to a Sinclair 16K Ram pack to make it Ace compatible?

A Very few retailers still stock the Ace, you would find it much easier to buy one direct from Boldfield Electronics who now market the Ace A 16K Ace will cost you around £80

Sales figures are difficult to come by, but at least 20 000 must have been sold. The low cost of Ace add-ons makes it unprofitable to try and adapt existing Sinclair or other bits and pieces

Just a myth?

Lap Ki Kan of London writes.

Q **In one of your earlier issues, you revealed to us a device to allow CBM 64 users to use Spectrum programs. Please can you give us more information on it and its cost?**

A The mysterious Spectrum emulator has not yet emerged into the sight of an eagerly waiting world and rumours abound as to whether it is just a myth.

From a technical standpoint the idea of being able to fit a Z80 emulator as *well* as a commercial Spectrum program into the Commodore 64 seems highly unlikely

Just hype, I would suggest. Don't hold your breath

Basic problem

William McCulloch of Bonnyrigg Midlothian writes

Q **I have a Vic20 computer and have been programming in Basic for some time When I use the Ram area at the top of the 16K expansion, user defined graphics characters do not work. I would be obliged if you could give me some advice on this matter.**

A As I don't know what you are doing, or how you are trying to create your user defined characters, I can only suggest what might be going wrong It seems most likely that you have *forgotten* to relocate the screen in Ram or to have moved the character set. Both these actions are performed by the following code.

```
POKE 648,30:POKE 642 32.
POKE    36869,240 POKE
36866,150:POKE 0,108 POKE 1,0:
POKE 2 192:SYS(0)
POKE 52,28:POKE 56,28:CLR
FOR    I 7168    TO
7679:POKEI PEEK(I)+25600(,NEXT!
POKE 36869 255
```

If this does not cure your problem then write to me again with full details of what you are doing

Cobol compiler

Geoff Haydock of Salford, writes

Q **I hope to be joining a course in Computer Studies shortly, during which I will be learning COBOL I would like to purchase a COBOL compiler for my CBM 64, but have been unable to find one I would be grateful if you could supply information of any available programs, together with the appropriate addresses and prices.**

A COBOL for the CBM 64 is no problem   except the cost. You will need to run CP/M on your machine before you can run COBOL This in itself is not that cheap CIS COBOL is distributed by Microfocus, who can be contacted on Swindon 695881

However there is yet more bad news. You will need discs, of course and a printer but the worst news is that CIS COBOL costs £488.75 Bad news, eh? Unfortunately that is the cheapest version available for the CP/M CBM 64

On/off power

Ian Adey of Halifax, West Yorkshire writes

Q **I would be grateful if you could tell me the *Poke* address which switches on/off power to the CN2 cassette on the Commodore 64.**

A Memory location 1 is the I/O Port address byte Bit 5 of this is the cassette motor control bit. If it is set on, the motor is turned off if this bit is off the motor is turned on. Obvious really, isn't it?

The other bits in this byte are used for very important purposes, so they are best left untouched So, to turn the motor on you could write (in Basic) *Poke 1, (Peek 1 and 251)*

To turn the motor off you would have to save the contents of address 1 and *Poke* the saved value back when you had finished with the cassette

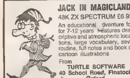
Price restriction

Paul Tang of Burton-on-Trent writes

Q **I am considering buying a modem, but am unsure as to which one to get. I am restricted to the ones under £100 Could you suggest one please? Could I get one in kit form for my BBC B?**

A In the under £100 range, the Maplin Modem is probably your best bet. It comes in two forms ready made or as a kit — the choice is yours. You can contact Maplin on 0702-552941 Although the Maplin modem does not offer the same range of facilities as the more expensive varieties at £40 or so it offers very good value for money to those just entering the world of computer communications.

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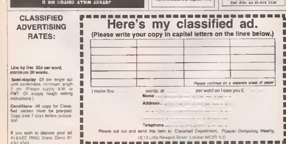
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NEWBRAIN A £99 64K memory expansion £150 Floppy controller and CPM £125 Large power supply £30 Newbar assembler £20 Various odds and software All unused. Vic 01-904 5849 evenings

QL FOR SALE Latest JM Rom version. Only used once RS232 lead included must sell for financial reasons Tel 0904 763184

ORIC ATMOS 48K with 13 tapes hobbit chess zenon etc plus joystick interface 8 books lots type in progs £110 ono wife not compatable Lea Valley 9-711927

VIDEO GAmes system, with unique built in TV including 2 games £33 Tel Brighton 665351

CURRAH Speech, manual cassette £20 Dk'tronics light pen manual cassette £12.50 bug-byte cookbook two cassettes, new unused boxed unwanted gift £6.50 0428 713019

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap *Popular Computing Weekly* 12-13 Little Newport Street London WC2R 3LD or telephone 01 437 4343

All software offered through computer swap must be in original condition and for private sale only

It cannot be swapped

Warning It is illegal to advertise pirated software

COMPUTER SWAP

Please write your copy in capital letters on the lines below

Name

Address

Telephone

SMITH S complete compatible cassette recorder 4 months old Not needed anymore Cost £35. Sell £22 00 Tel Simon on L/Buzzard (0525) 375369

METTEL Intellivision colour TV games machine complete in original box 3 Rom cartridge games Ideal Xmas gift £55 00 Tel 01 577 2839

AMSTRAD CPC464 for sale Brand new unwanted gift complete with manual for bargain at £180 Phone John 021-784 0138

ZX MICRODRIVE - Interface I inc 2 microdrive cartridge Perfect condition £89 Tel clownland 53157 eves only

NEW DAISYWHEEL PRINTER & monitor Guaranteed £250 01 736 7536

ORIC 1 48K, brand new with high quality tape deck around £80 worth of software and books Software includes Hunchback The Ultra, Harrier Attack Offers above £100 Ring Nuneaton 327803 evenings

TRS-80 64K disk drive plus S/W and RS232 Interface £450 Tel (0684) 810015

PROGRAMMABLE CAMBRIDGE joystick interface with joystick for £20 with tape. Brand new magazines for sale! Your Computer C and VG PCW ZX Comp New Quickshot 1 joystick for £6 in box New Phone Sia nee 57066

48K MODI TRS 80 + expansion interface + monitor + disk drive + cassette recorder + sound box + 200 programs on 20 cassettes and 50 disks + 4 books + manuals £375 061 928 2923 (home) 061 273 3333 ext 3129 (work) Mike Hounsome

ORIC I 48K Original programs inc machine code wreel disassembler Zenon Donkeykong, 2 books + mags Excellent condition £95 Tel Ipswich 57180

COLEVISION TV game 9 games. Steering wheel £179 ono 0703 464180 after 6pm.

TEXAS TI99/4A 16K computer extended Basic speech synthesizer - s/w + manuals as new £150 Tel 01 [illegible] 6548

DISK DRIVE TEAK 5 ¼" 40 tracks 100K with cables for BBC micro £100 Tel Luton (0582) 27573

ITT 20 20 DISK DRIVE Toxeco monitor word processor s/w £300 Tel 01 738 7936

TERMINAL with VDU 100 key keyboard RS232 centronics + cassette ports up 119600 baud, 80 column £60 or swap for hardware Fleming 16 St Leonards Rd Stockport SK4 2RD Phone 061-432 4536

SPECTRAVIDEO 328 real keyboard sprites and three sound channels 32K Basic cassette unit five games + Sprite editor all boxed £260 call Tony on Newcastle 2712306 after 4pm weekdays

COLOUR GENIE 32K tape recorder 6 tapes books Can be seen working £100 cash Tel (0727) 52744

CAMBRIDGE Computing programmable joystick and interface for Spectrum Joystick has two independent fire buttons and is microdrive compatible For quick sale before Christmas only £20 (includes tape) Phone Bookham 56327

THREE CHANNEL SOUND generator for Spectrum Includes instructions demo tape SW "Beep" amplifier Uses AY 3-8910 sound chip easily programmed. Only £15 ono Phone Bookham 56327

BROTHER EP 22 printer/electronic typewriter with power supply and ribbons As new Ideal for Spectrum £135 ono Tel Alan (0294) 84235 evenings

FRENCH OR GERMAN language translator and vocab tester for 48K Spectrum A bargain at £3 00 Send P O cheque straight away to Monksoft, Highland Blue Hays Park Minchinhampton Stroud Glos GL6 9JT

ATMOS 48K £150 Software including Hunchback Hobbit Scuba Dive Zorgons revenge joystick and interface and six books What a bargain at £220 Tel 0733 264461 after 6pm

SHARP MZ80A as new with integral cassette and monitor Games utilities and books £300 Any offer considered Tel Worthing (0903) 6790370 after 6pm weekdays any time weekends

ENHANCE YOUR SPECTRUM Beep! Harmony generator will digitally generate seven octave range in harmony with Spectrum! Also generates three line fifths Fantastic effect Kit £22 or built £28 Bookham 56327

HOME COMPUTER COURSE by Observer binders Good condition £18 [illegible] 863 5106

Wanted

WANTED ATARI VCS with Lot Ass cartridges swap Spectrum 48K tape recorder Kempston interface joystick Any area S Larkin 25 Stakeley Walk Great Lever Bolton

WANTED FOR TEXAS TI99 4A RS232 card disc drive card TI logo P card modules etc Please phone prices Bournemouth 020 433704

WANTED SWAP ELECTRONIC organ Wurlitzer 4030R with swinging rhythm and multi-matic percussion two key boards pedals complete with stool Perfect for best BBC (B) package or similar (0803) 842 862 D V Grey (Devon)

WANTED SPECTRUM SOFTWARE Beachhead Decathlon Monty Mole Hulk Avalon Sherlock Blaxx Bluff Eureka White Lightning Best offer secures purchase Write S Winter 28 Cross Grove Chalfont St Peter Gerrards Cross Bucks SL9 9HD

SWAP CURRAH MICROSPEECH and Kempston Protek joystick interface with Quickshot II Stik (all boxed) will swap the lot for Alpha-com printer Phone Steve 01 853 1170 (eves)

WANTED SINCLAIR interface 1 microdrive and cartridges to swap for Prism VTX5000 Modem Also wanted Stonechip joystick interface to swap for £36 of s w incl Sabre Wulf Mugsy Tel (0267) 32561 (after 4pm on weekdays)

SWAP PRAKTICA MTL3 35mm camera, plus Helios 85 210mm zoom lens plus tripod and other bits for Spectrum b/w or sell £100 Write R Anley 25 Grange Avenue Marsden Huddersfield W Yorks HD7 6AQ

WANTED SWAP brand new Brother portable typewriter for Commodore printer or one compatible Tel Mablethorpe (Lincs) 77352 Ask for Mr Watson

SWAP CB RIG and accessories Rig has R Meep 40CH FM CBX for Vic20 starter pack Also wanted Vic20 or 64 not working for parts Please ring 061 [illegible] 6028

SWAP YAESU FT-101Z transceiver Also Yaesu FC 902 A.T.U for BBC B computer and hardware software or any good computer system. Whitstable 61847

WILL SWAP £70 of original super Spectrum computer games for one working ZX microdrive and one blank microtape Telephone Grangemouth [illegible]120

SWAP DRAGON 32, B/W T V joystick 3 books printer lead and over £600 worth of software for Amstrad CPC464 or sell for £150 ono Call Dean on 021 523 9710 after 5pm.

WILL ANYBODY swap my copy of Understanding Your Spectrum for Over The Spectrum or Supercharge Your Spectrum? Ring 01 330 5492.

EXCHANGE COMPUTER Battleships for small cheap computer i.e. Aquarius ZX80 etc. Replies to H Walter 36 Spinney St Raunds Northants NN9 6ES Buyer collects if possible

SWAP ATARI VCS all boxed 2 months guarantee with 14 games bargain at £100 or will swap for a Spectrum 48K Must be in good condition 0582 598578

WANTED FDS type keyboards for ZX81 reasonably priced 021 444 8124 weekdays

SWAP MY Acorn Electron perfect condition (unused guarantee) all leads s/w manual radio cassette recorder 14" colour TV for BBC B in good condition (latest manual) 061-442-4008

WANTED 1541 disk drive Multiplan The Last One etc Tel 0484 29990 after 7pm.

SWAP AN Oric 48K + 25 games and £200 for an Amstrad CPC464 (colour monitor) Contact N Elen 47 Oakwood Road Bricket Wood St Albans Herts. Also Spectrum for sale Garston 542306 (eves)

SWAP T1 99/4A adventure cassette software Adventureland Mission Impossible Mystery Funhouse Pyramid Voodoo Odyssey for extended Basic or mini memory or sell £3.50 each 32 Glenbeck Park, Dunmurry Belfast BT17 9RA

WANTED JUPITER ace or ZX printer will pay £15 or swap Spectrum software including Hurg, Football Manager Maniacs and more Contact Steve 28A Artillery Terrace Guildford, Surrey

WANTED BBC B with disk drive will exchange Dewalt 125 Radial Arm Saw with sturdy stand extended table and extra 80 teeth OTC blade for cabinet work 0423 74388

SWAP VIC 20 with no sound complete with game joystick and manual for a good condition ZX printer or £20 Telephone 03241 443557 after 7pm

WANTED SINCLAIR 48K or 16K (Mark 1 or 2) Spectrum + powerpack must be v g c No peripherals necessary South England only Southampton 332285

WANTED ALPHA Com 3125 printer + TC interface cable for TI994A. Tel Staines 54306 eves

RS232 LEAD for use with interface one to go to standard RS232 compatible printer Swap for any recent software for ZX Spectrum Must be original Ring Paul 08864 588 (Worcester)

WANTED BBC B OS 1.2 Basic II Also DFS and other extras considered (up to £480 available) can travel to view Please phone John 0642 484785 (Redcar) after 5pm or weekends

WANTED MODEM for CBM 64 + s/w Tel 061 722 3735

WANTED SPECTRUM hardware inc Interface 1 + Microdrive and any other s/w etc Also s/w to buy Tel Les 01 926 5151 Ext 3776

SWAP AMSTRAD concise Firm Ware manual for Amstrad Concise Basic manual Tel Norwich 402089

SWAP CBM 64 + C2N £190 of software for Electron with similar (or BBC B) or sell for £240 Swap 1541 disk drive for colour monitor (0604) 707868

PURCHASED A Commodore 64 but wishing you had bought a 48K Spectrum - books + magazines + over 60 strategy arcade + simulation software + tape recorder Swap for Commodore 64 or sell for £170 ono 02505 [illegible]

WANTED SPECTRUM 48K or 16K cheapish In the Anglia area Phone (0604) 45658 ask for Mr Robert Haynes

WANTED - ANY information or software for the ZX80 especially required 16K Ram pack Also for Vic 80 Thorn/EMI's "Pharaoh's Curse" Terminal's Rescue from Castle Dread" and Atari soft & "Defender" (Urgent) 0684 822909

SWAP COMMODORE 64, C2N joystick 7 books 4 cartridges and 18 tapes for £450 Cost about £600 Tel 0780 53161 after 4pm and ask for Jason

SWAP MY Vic 20 + cash for CBM 64 plus joystick Must be reasonable condition. Phone Phil 01 577 2063

WANTED BBC model B with all lead Q s/w £250 cash available Tel 01 604 5214

WANTED CBM 3032 and 3040 Must be in good condition Tel Romford 48848

WANTED ZX printer in good condition, pay up to £20 Tel Mr Allan 01 500 8301 after 6pm

CBM 64 Q C2N + joystick + s/w, swap for BBC Tel (0240) 652656

WANTED FELLOW MZ700 enthusiasts in North London to exchange ideas and give mutual help/advice Phone 01-889 1090 evenings

WANTED VERY poor unemployed Spectrum owner needs your unwanted ZX printer Must be incredibly cheap (or free?!) Tel (0752) 843121 Someone out there must be feeling generous today!

48K SPECTRUM Q s/w to swap for Atari 800 Tel 0744 815076

ADVENTURE HELPLINE

The Hulk on Spectrum. How do I get out of the dome? How can I remove the ring and still stay as The Hulk? Stephen Douglas 10 Hillside Close Abbots Langley Watford Herts.

Knights Quest on Spectrum. How do I get past the vines in the forrest? Sean Devaney 19 Gilbridge Road, Whalley Range, Mer 16

McKenzie on Spectrum. How do I repair the jet-pack and the an droid? How do I get the power pack? P M Brannigan, 11 Morningside View West Derby Liverpool.

Hobbit on Spectrum. I cannot get out of the elvin kings cellar David Guthrie Jr 4 County Houses, Easter Kintrae Elgin Moray Scotland.

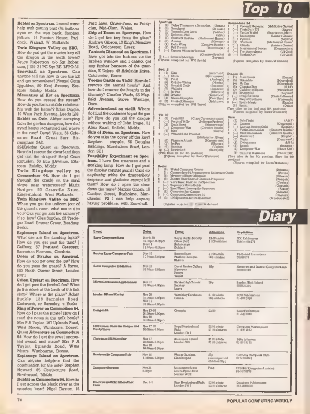
Valhalla on Spectrum. How do I get Ofnir? Stuart Jones, 20 Diane Drive Rhyl, Clwyd, N Wales.

Hobbit on Spectrum. I cannot get through the magic door, or kill the dragon, How do you get back home once you've killed it? Neil Poxson, 16 Parkside Ladgate Lane Middlesborough, Cleveland.

Madness and the Minotaur on Dragon. I can't find the mushrooms, on level 1 so I can't access the magic spells Richard Iveson, the Cottage Patrington, N Humberside

Feasibility Experiment (on Commodore 64. Where is the wick for the lamp? What should I do with the dragon? Richard Blythe 4Meriden Avenue, Gildersome Leeds, W Yorks.

224System 15000 on Commodore 64. I can't get started. I don't know what to do when the screen displays 'please instruct' Bel Cane, 39 Hy Regt RA, BFPO 15 W Germany



Hobbit on Spectrum. I need some help with getting past the bulbous eyes on the way back. Stephen Jeffries 14 Preston House, Paddock, Walsall, W Midlands

Twin Kingdom Valley on BBC. How do you get the master key off the dragon in the north tower? Bruce Robertson c/o Sgt Robertson, J 189 31 PC Sqn RE BFPO 38.

Snowball on Spectrum Can anyone tell me how to use the lift and get somewhere? Please! Conn Iggulden, 50 Elm Avenue, Eastcote Ruislip Middx

Mountains of Ket on Spectrum. How do you cross the stream? How do you form a stable relationship with the horse?? Brian Diggle, 12 West Park Avenue Leeds LS8

Hobbit on Oric. After escaping from the goblins dungeon, how do I avoid being recaptured and where is the ring? David Wain, 38 Colebaine Road Great Barr Birmingham B42.

Knights Quest on Spectrum. How do I rescue the dwarf and then get out the dragon? Help! Conn Iggulden, 50 Elm Avenue, EAstcote Ruislip, Middx

Twin Kingdom valley on Commodore 64. How do I get through the crack on the sand slope near watermeet? Maris Hodges 52 Granville Drive, Kingswinford West Midlands.

Twin Kingdom Valley on BBC When you get the uniform out of the guard's room what use is it to you? Can you get into the armoury? If so how? Glen Sugden, 28 Tredegar Road Emmer Green, Reading Berks.

Espionage Island on Spectrum. What use are the landing lights? How do you get past the tand? J Gaffney, 87 Portland Crescent, Barrow-in Furness, Cumbria.

Doom of Stradus on Amstrad. How do you get over the pit? How do you pass the guard? A Byrne, 190 North Gower Street, London NW1

Urban Upstart on Spectrum. How do I get past the football fan? What is the noise at the back of the fish shop? Where is the plane? Adam Buckle 188 Barnsley Road Cudworth, nr Barnsley, s Yorks

Ring of Power on Commodore 64. How do I pass the pirate? How do I read the notes in the milk bottle? Mrs P A Taylor 167 Uplands Road, West Moors, Wimborne, Dorset.

Quest Adventure on Commodore 64. How do I get the jewel encrusted sword and mace? Mrs P A Taylor, Uplands Road, West Moors Wimbourne, Dorset.

Espionage Island on Spectrum. Can anyone help me find the combination for the safe? Stephen Howard 65 Cranbourne Road, Northwood, Middx.

Hobbit on Commodore 64. How do I get across the black river in the wooden boat? Nigel Davies, 15 Parc Lane, Groes-Faen, nr Pontyclun, Mid-Glam, Wales.

Ship of Doom on Spectrum. How do I get the key from the glass? Andrew Gibson, 15 King's Meadow Road, Colchester Essex.

Fantasia Diamond on Spectrum. I have got into the fortress via the broken window and I cannot get any further because of the guardian, E Dukro 43 Adelaide Drive, Colchester, Essex.

Voodoo Castle on Vic20 How do I remove the animal heads? And how do I remove the boards in the chimney? Charles Wade, 63 Mayfield Avenue, Grove Wantage, Oxon.

Adventureland on vic20. Where do I find the container to put the gas in? How do you kill the dragon without waking it? John Irvine, 61 Alma Road, Enfield, Middx.

Ship of Doom on Spectrum. How do you take the cover off the key? Stephen Supple, 65 Douglas Buildings, Marshalsea Road, London SE1

Feasibility Experiment on Spectrum. I have five treasures and a smoking lamp How do I get past the display cabinet guard? Can I do anything with the dragon/lion/emperor and gladiator except kill them? How do I open the door down the mine? Marcus Groan, 18 Cuofton Street, Rusholme, Manchester PS I can help anyone having problems with Snowball.

Top 10

Spectrum

1	(1)	Daley Thompson's Decathlon	(Ocean)
2	(3)	Beachhead	(US Gold)
3	(2)	Tornado Low Level	(Vortex)
4	(5)	Kokotoni Wilf	(Elite)
5	(6)	Sherlock Holmes	(Melbourne House)
6	(3)	Avalon	(Hewson)
7	(4)	Delta Wing	(Creative Sparks)
8	(8)	Full Throttle	(Micromega)
9	(—)	Danger Mouse in Trouble	(Creative Sparks)
10	(—)	Lords of Midnight	(Beyond)

(Figures compiled by WH Smith)

BBC B

1	(1)	Elite	(Acornsoft)
2	(—)	Mr Ee	(Micropower)
3	(2)	Frak!	(Aardvark)
4	(8)	Erik the Viking	(Mosaic)
5	(7)	Smash & Grab	(Superior)
6	(9)	Wallaby	(Superior)
7	(—)	Jet Pac	(Ultimate)
8	(10)	Aviator	(Acornsoft)
9	(4)	Micro-Olympics	(Data Base)
10	(3)	Football Manager	(Addictive)

(Figures compiled by WH Smith)

Vic 20

1	(9)	Flight 015	(Crazy Communications)
2	(—)	Perils of Willy	(Software Projects)
3	(2)	Duck Shoot	(Mastertronic)
4	(—)	Computer War	(Creative Sparks)
	(5)	Nax	(Anirog)
6	(—)	Wizard & the Princess	(Melbourne House)
7	(6)	Pharaoh Attack	(Mastertronic)
8	(3)	Jet Pac	(Ultimate)
9	(5)	Bewitched	(Visions)
10	(—)	Bewitched	(Beau Jolly)

(Two titles tie for 4th position)
(Figures compiled by Boots/Websters)

Books

1	(1)	Weird Computer Games	(Usborne)
	(1)	Commodore 64 Programmers Reference Guide	(Pitman)
3	(4)	Mystery of Silver Mountain	(Usborne)
4	(6)	[illegible] of Games & Programs	(Penguin)
5	(—)	Very Basic Basic on the Spectrum	(Century)
	(—)	Beginners Micro Guide	(Granada)
7	(—)	[illegible] Easy on the Spectrum	(Arrow)
8	(4)	Computer Spy Games	(Usborne)
9	(—)	Computer Commodore 64	(Granada)
10	(5)	[illegible] for the Spectrum	(Prentice-Hall)

(Figures compiled by [illegible])

Commodore 64

1	(—)	Football Manager	(Addictive Games)
2	(—)	Flight Path 737	(Anirog)
3	(—)	Trollie Wallie	(Interceptor Micros)
4	(—)	Boogaboo	(Leisure Genius)
5	(—)	Psytron	(Beyond)
6	(1)	Sherlock	(Melbourne House)
7	(—)	Cluedo	(Leisure Genius)
8	(—)	International Soccer	(Commodore)
9	(—)	Fort Apocalypse	(US Gold)
10	(—)	Spitfire Ace	(US Gold)

(Figures compiled by Boots/Websters)

Dragon 32

1	(1)	Hunchback	(Ocean)
2	(5)	Scramble	(Microdeal)
	(4)	Mr Dig	(Microdeal)
4	(6)	Chuckie Egg	(A & F)
5	(2)	Cuthbert in Space	(Microdeal)
6	(8)	Dragonpiel	(Beyond)
7	(—)	Dragon Chess	(Oasis Software)
8	(7)	Ring of Darkness	(Wintersoft)
9	(—)	Spectre Magic	(Knight)
	(8)	Sprint	(Oasis)

(Two titles tie for 2nd and 9th positions)
(Figures supplied by Boots/Websters)

Oric

1	(1)	Solo Flight	(A & F)
2	(2)	Zaxxon	(Centresoft)
3	(—)	Captain Sticky's Gold	(English)
4	(8)	Tank Commander	(Creative Sparks)
5	(—)	Fox Commander	(Creative Sparks)
	(—)	Australia 8	(English)
7	(5)	Sticky	(Centresoft)
8	(4)	Cybernetic	(L & S)
9	(3)	Loggit	(Imagine)
	(7)	Computer War	(Thorn EMI)
	(3)	Carnival Massacre	(Thorn EMI)

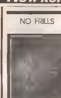
(Two titles tie for 5th position, Share for 9th position)
(Figures compiled by Boots/Websters)

Diary

Event	Dates	Venue	Admission	Organisers
Eastern Computer Show	Nov 9-10 12.00pm-8.00pm Nov 11 12.00pm-6.00pm	Royal Dublin Society (Main Hall) Ballsbridge Dublin 4	£2.00 adults £1.00 children	SDL Exhibitions Dublin 688171
Boston Eastern Computer Fair	Nov 10 10.00am-5.00pm	Boston East Pavilion Gardens Shows	£1.00 adults 30p children	Technical Promotions 0000 8174
Eastern Computer Exhibition	Nov 10 10.00am-5.00pm	David Davies Gallery Newtown Powys Wales	50p	Newtown and District Computer Club 0686 26118
Microelectronics Applications	Nov 17 10.00am-4.00pm	Bardon High School Barnsley Leeds	50p	Bardon High School 0000 30364
London Micro Market	Nov 10 10.00am-6.00pm Nov 11 10.00am-4.00pm	Wembley Exhibition Centre	£1.50 adults 75p children	BCC Publications 01-300 3506
Compec 84	Nov 13-16 10.00am-6.00pm Nov 16 10.00am-5.30pm	Olympia	£3.00	Reed Exhibitions 01-643 8080
6809 Colour Show for Dragon and Tandy Show	Nov 17-18 10.00am-6.00pm	Royal Horticultural Halls London SW1	£2.00 adults £1.00 children	Computer Marketplace 01 930 2012
Christmas UK Microfair	Nov 17 10.00am-6.00pm Nov 18 10.00am-5.00pm	Alexandra Palace London N22	£1.00 adults £1.00 children	Mike Johnston 01-801 9172
Humberside Computer Fair	Nov 16 11.00am-5.30pm	Winter Gardens Cleethorpes	30p (unaccompanied children 20p)	Grimsby Computer Club 0472 864647
Computer Auction	Nov 26 6.00pm	Bonningtons Hotel Southampton Row London WC2	Free	Crocker Computer Auctions 01-307 8836
Electron and BBC Micro User Show	Dec 6-9	New Horticultural Halls London SW1	£2.00 adults £2.00 children	Database Publications 061-456 8383

New Releases

NO FRILLS



Drelbs is the latest American import to be launched on the discerning Great British Public by US Gold, who so recently brought us the official version of *Zaxxon*.

Originally produced by Synapse — one of the top US houses — it is an excellent little game, drawing on but not plagiarising, several arcade themes.

It consists of two main screens. The first is a swivelling maze, as in *Ladybug*, in which you, a drelb, must create squares whilst being pursued by two different sorts of nasty. This is fun. The squares change colour and are now solid.

When you have made all the squares you can, they start changing into nasty faces — all except one which is a door into the next screen. Here you rescue all your frozen Drelb brethren by tagging them, avoiding being zapped by new nasties. Success takes you back to the first screen, but harder. Few frills, just pretty good.

So why is US Gold's other Synapse title *Fort Apocalypse* so utterly abysmal?

Program *Drelbs*
Price *£5.95(C) £12.95(D)*
Micro *CBM 64 & Atari 32K*
Supplier *US Gold, Unit 10, Parkway Ind Centre, Heneage Street, Birmingham B7*

STRAY DNA

As we all know, being the last surviving member of your race is something of a trial. For a start, there's never anyone around to drive you home after a heavy session down the pub. It also takes a hell of a long time to get served.

Still, as far as I am concerned, it is no excuse to go wandering around a 4096-room complex collecting orbs and stray bits of DNA, dressed in a one-piece yellow jump-suit. Is this the reason that apparitions (formed from pure energy) are out to get you? Nevertheless Xavior has been set the task of resurrecting the human race.

Well implemented and designed this PSS game may be, but it does seem to owe something (well quite a lot, really) to that well known hit — *Atic Atac*.

I shall carry on waiting for *Swords and Sorcery*.

Program *Xavior*
Price *£5.95*
Micro *Spectrum 48K*
Supplier *PSS, 452 Stoney Stanton Rd, Coventry, CV6 5DG*

DISPLAYED

The Soft Sell is a programming utility which enables you to construct advertising sequences and announcements to run on a Dragon. A total of 17 graphic displays can be sequenced together to create the kind of display used in window fronts, etc.

There is an extensive manual with the program which even covers things like plugging in the computer. Actually creating the text and designs is a matter of using cursor keys to trace an outline and other keys to add colour and copy one part of the screen to another.

It's pretty easy to use and I suppose may be a boon to shopkeepers everywhere. I can't help wondering why it's for the Dragon which has amongst the worst graphics of any home micro. It's also pretty expensive at £17.25.

Program *The Soft Sell*
Price *£17.25*
Micro *Dragon*
Supplier *Micro Sign, P O Box 60, Woking, Surrey*

VOCAB TEST

Kosmos have been issuing language teaching programs for a while now and is one of the few companies that has a Spanish tutorial program. *The Spanish Tutor* has recently been released for the Commodore 64.

All the programs use a simple tutorial program to teach basic keyboard familiarity and have facilities for you to add your own grammar and vocabulary. Pre-recorded lessons include basic vocab, verb conjunctions, prepositions and complete phrases. The language can also be tested in a variety of ways. The course is divided over two tapes which have an awfully silly Spanish man on the cassette cover.

Program *The Spanish Tutor*
Price *£8.95*
Micro *Spectrum*
Supplier *Kosmos, 1 Pilgrims Close, Harlington, Dunstable, Beds*

This Week

Program	Type	Micro	Price	Supplier
Return to Eden	Ad	Amstrad CPC424	£9.95	Level 9
Football Manager	S	Amstrad CPC424	£7.95	Addictive Games
Horse Lord	Arc	BBC B	£8.95	Century
PCW Games Collection	Arc	BBC B	£4.95	Century
Project Planner	Bus	BBC B	£24.95	Triptych
Micro Utilities	Ut	BBC B	£8.95	Shiva Software
Eureka	Ad	Commodore 64	£14.95	Domark
Cliffhanger	Arc	Commodore 64	£7.95	New Generation
Dr's Baby	Arc	Commodore 64	£6.95	Microdeal
Drelbs	Arc	Commodore 64	£9.95	US Gold
Fort Apocalypse	Arc	Commodore 64	£9.95	US Gold
Gun Dogs	Arc	Commodore 64	£7.95	Hill MacGibbon
Guzzler	Arc	Commodore 64	£7.00	Interceptor
Psi-Warrior	Arc	Commodore 64	£9.95	Beyond
Quango	Arc	Commodore 64	£7.00	Interceptor
Thrusta	Arc	Commodore 64	£7.95	Software Projects
Entrepreneur	Ut	Commodore 64	£24.95	Tryptic
Magpie Database	Ut	Commodore 64	£39.95	Audiogenic
Swift Spreadsheet	Ut	Commodore 64	£19.95	Audiogenic
Wordcraft	Ut	Commodore 64	£24.95	Audiogenic
PCW Games Collection	Arc	Electron	£4.95	Century
Shapes & Colours	Ed	QL	£12.50	Key Software

New Releases

FLAGSHIP

With one exception support for the Oric/Atmos would seem to have dried up. The exception is a French company called No Man's Land whose products are now available in this country. *Tyrann* is probably the flagship of its range — it's an adventure with graphics in the Dungeons and Dragons style.





To begin you choose your character — Warrior, Thief, Druid or Magician — each has its own strengths and weaknesses. You then move around the village of Golassar which is displayed in line drawn pictures with simple perspective.

You may trade, be forced to fight, use some objects and save games and characters for later use. You get a nice manual and at £8.95 the program is not overpriced by Oric standards. Good news for drought hit Oric/Atmos owners.

Program	*Tyrann*
Price	*£8.95*
Micro	*Oric/Atmos*
Supplier	*No Man's Land, High Tech Units, 1 and 3 Conlon Developments, Water Lane, Darwen, Lancs*

UNDERGROUND

Interceptor produce well written, fun games that really only ever have one major failing — they are never original. The latest Commodore release is a case in point. *Quango* is a game in which you burrow around underground chased by robots as you try to encourage your mushrooms to grow. Kill the robots by digging the ground from underneath stones which then fall on them — remind you of something? Yes, it's *Dig Dug* in a new guise.

Not that it's a bad game unlike *Manic Miner* there aren't that many versions of *Dig Dug* around. Consequently as a game it hasn't become that wearisome. Angus (you) dodges robots and strange weeds whilst making his way towards the centre of each cavern.

There are various caves as you get deeper and deeper so underground streams slowly flood the passages making it more difficult for Angus to harvest his crop of mushrooms. Quite fun if unspectacular.

Program	*Quango*
Price	*£7.00*
Micro	*Commodore 64*
Supplier	*Interceptor Micros, Lindon House, The Green, Tadley, Hants*

SKYSCRAPER

Plummet is one of a growing range of Spectrum games from Interceptor and it's actually pretty good. The idea is to rescue the mayor who is stuck in a lift. Why a mayor? I know not.

The salvation comes when you — Orson — collect enough ropes to tie the lift securely to its supporting chain. The game is played over three screens forming a giant skyscraper. Orson collects ropes scattered about the screen, dodges a variety of irrelevant objects and makes his way to the lift.

There is a Zombie Doorman who appears and disappears and whom you can stun with a tranquiliser dart — the game may be basically only dodge and grab, but there's enough different about it to make it interesting for at least a couple of minutes. The graphics are large and sprite-like, but they suffer from the inevitable colour change when they pass one another.

Program	*Plummet*
Price	*£7*
Micro	*Spectrum*
Supplier	*Interceptor Micros, Lindon House, The Green, Tadley, Hants*

NEW COMMANDS

The Commodore 64 has terrible Basic. This is a fact accepted through the great passages of time as immutable and certain. To improve this situation, there have been a great number of extensions to Basic beginning with Simon's Basic and continuing every other month with another one from someone else.

Possibly the definitive extension to Basic will prove to be *Braden's Basic* written by Vi soro and marketed by CSM. It is beautifully packaged in a fold-out wallet, one side containing the cassette and disc and the other contains the large, Spectrum manual type book which explains how to use the new commands.

Obviously the bulk of the new commands are concerned with sound and graphics, eg EMOB to turn on a sprite. Envelope simplifies the sound command.

It doesn't end there, though, you get useful structured basic commands like While Do Else and Repeat Until and commands like Clrt to clear a specific bit. If you are into programming, own a Commodore 64 and have a spare £39.95, then this is for you.

This Week

Program	Type	Micro	Price	Supplier
Barrow Quest	Ad	Spectrum	£6.95	CCS
Eureka	Ad	Spectrum	£14.95	Domark
Jewels of Babylon	Ad	Spectrum	£5.50	Interceptor
Astronut	Arc	Spectrum	£5.95	Software Projects
BMX Trials	Arc	Spectrum	£6.95	Llamlan
Fahrenheit 3000	Arc	Spectrum	£5.95	Softstone
Magic Roundabout	Arc	Spectrum	£6.95	CRL
Trio	Arc	Spectrum	£5.95	Addictive Games
Warlords	Arc	Spectrum	£6.95	Century
Xavier	Arc	Spectrum	£5.95	PSS
American Football	S	Spectrum	£5.95	Softstone
Falklands Crisis	S	Spectrum	£5.95	Llamlan
Grand Prix Manager	S	Spectrum	£6.95	Addictive Games
Punch Line	S	Spectrum	£6.95	Llamlan
Superpower	S	Spectrum	£5.95	CCS
Sound Effects	U	Spectrum	£6.95	Llamlan
Run Your Own League	Ut	Spectrum	£5.95	Addictive Games
Fatty Henery	Arc	Vic 20	£6.95	Software Projects

Program	*Bredan's Basic*
Price	*£39.95*
Micro	*Commodore 64*
Supplier	*CSM*
	Strand House
	Great West Road
	Brentford
	Middlesex

NO MISTAKE

Gener 80 is a sophisticated editor-assembler for the Spectrum which does amazing things

The source code is processed immediately so that syntax mistakes are immediately spotted — the program can assemble 3000 lines in under 10 seconds

You can edit anywhere on screen, use block move and delete, use all standard Z80 mnemonics and even use Sinclair system variable names as labels. All code can be saved either to tape or microdrive — *Gener 80* itself can also be saved to microdrive from the original cassette

Obviously not intended for beginners the program nevertheless comes with a 32-page manual which is pretty good and quite helpful, even for the novice

Program	*Gener 80*
Price	*£7.95*
Micro	*Spectrum*
Supplier	*Seven Stars*
	15 Gloucester Avenue
	London NW1 7AU

PULSATING

Skyline Attack from Century Software is pretty much your classic blam blam stuff which only has a reason for its existence if you don't already have something similar

Basically it's *Defender* as you move your highly manoeuvrable jet back and forth across scrolling screens and blast everything in sight, except canisters of medical supplies that occasionally drop from the sky

It's all reactions, screen fulls of pulsating aliens — the only new feature is this it takes place over a number of recognisable skylines like Paris and London. If you've just bought your Commodore and don't have anything to kill yet, then this is for you. If not forget it.

Program	*Skyline Attack*
Price	*£7.55*
Micro	*Commodore 64*
Supplier	*Century Publishing*
	Portland House
	12-13 Greek Street
	London W1V 5LE

RETRIEVED

A potentially useful utility from a company called Lost n Found Software is *Get it Back*, a disc-based program that can retrieve lost files

What this and similar systems allow is the retrieval of information on disc which appeared to have been lost through disc damage and have resulted in error messages when you attempted to load them

Obviously you can't get everything back if you have completely wiped information from a disc and put something new on it — rather it's intended for those cases where you know that the stuff is still there, but just can't seem to get to it.

How the program works I know not — probably it just searches through the disc, loading up what data it can find and ignoring errors. Seems like it's a program worth having anyway. It's easy to use too

Program	*Get it Back*
Price	*£5.95*
Micro	*Commodore 64*
Supplier	*Lost n Found*
	17 Pitfield Street
	London N1

FULL HOUSE

Fancy playing *Bingo* on your micro? No I don't either. Still if you feel you've been missing out by being too old to subscribe to the *Sun* and you've lost your *Times* Portfolio card, you could at least win REAL MONEY on *Bingo* from Tynesoft

Up to four people can play the computer and beyond saying that it plays Bingo, there's not much comment I can make. However, every time someone wins the last four numbers called are compared with four lucky numbers at the bottom of the screen. If the numbers match then you go into the draw for £100. You prove this by saving it to tape

If you have a Currah speech synthesizer then the program will actually shout the numbers out.

Personally, I don't like *Bingo* and will be putting my X in the box for no publicity

Program	*Bingo*
Price	*£5.95*
Micro	*Spectrum*
Supplier	*Tynesoft*
	Addison Industrial Estate
	Blaydon upon Tyne
	Tyne and Wear
	NE21 4TE

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases *Popular Computing Weekly* 12-13 Little Newport Street London WC2H 3LD

This Week

Addresses

Addictive Games, 7 Richmond Hill Bournemouth BH2 6HE **Audiogenic** PO Box 88 38 Sutton Industrial Park London Road Reading Berks RG6 1AZ **CCS,** 14 Langton Way London SE3 **Century Software,** 12-13 Greek Street London W1 **CRL,** 9 King's Yard Carpenter Road London E15 **Domark,** 228 Munster Road London SW6 **Hill McGibbon,** St Bartholomew House 92 Fleet Street London EC4 **Interceptor** Lindon House The Green Tadley Hants **Key Software** Newlands, Durley Brook Road Southampton **Level 9** 229 Hughenden Road High Wycombe Bucks HP13 5PG **Llainlan,** Pontyberem Llanelli Dyfed **Microdeal** 41 Truro Road St Austell Cornwall PL25 5JE **New Generation,** The Brooklands 15 Sunnybank Lyncombe Vale Bath BA2 4NC **PSS** 452 Stoney Stanton Road Coventry CV6 5DG **Shiva** Software The Hawthorns 64 Welsh Row, Nantwich Cheshire **Softstore,** Suite 1 39c Paddington Street London W1 **Software Projects,** Bear Brand Complex Allerton Road Woolton Liverpool **Triptych** TBL Book Service Freepost Camberley, Surrey GU15 3BR **US Gold,** Centresoft Unit 10 The Parkway Industrial Estate Centre Heneage Street Birmingham B7 4LY

Key **Ad** — adventure **Arc** — arcade/**Ed** — education/ **S** — strategy-simulation/**Ut** — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week *Popular Computing Weekly,* 12-13 Little Newport Street London WC2H 3LD

Grown-up's MSX

The latest news is that the CP/M disc operating system is to be implemented on the QL. Not only that but Amstrad will be providing it as an integral part of their disc system. Even the ever-receding Enterprise offers amongst its specifications CP/M compatability.

Further confirmation that home micros are rapidly crossing the divide into the heady world of small business systems and serious software. If you can control your feverish excitement for a second let's stop and think about what CP/M is, and what it can do — I believe that for 98% of people it is going to be an overblown waste of time.

The idea of CP/M came about as an attempt by Digital Research to overcome the continuing problems of non-compatability between different hardware systems, and avoid prolonged and unnecessary duplication of effort in software development. In short, it is a sort of grown ups MSX.

Despite its undoubted success I feel there are several prevalent misconceptions about what CP/M can offer this need clearing up.

The most commonly quoted justification for its existence is that it allows software compatability between different computers and gives access to a back-catalogue of over 3000 programs. Unfortunately this is only true up to a point. Whilst the major headaches of software redesign and debugging that accompany a conversion from say the Spectrum to the CBM 64 can be avoided, you will not be able to go out and buy any old CP/M program and run it on your micro. No machines can be completely software compatible without the rigid internal architecture and firm constraints that characterise the MSX machines or the more highly compatible IBM clones.

What this means is that you will only have access to the fraction of the 3000 CP/M titles that Amstrad, Enterprise or anyone else decide to convert unless you fancy doing the job yourself. Only the mainstream big-selling programs are likely to make an appearance.

The other big question about CP/M is, how many of the fraction of the 3 000 programs which are converted will you actually want? The biggest barrier I can see for most people is the price. For instance the *Wordstar* word processing package which must be the single biggest seller for CP/M still changes hands at the whopping price of £250 — more than most home hardware systems cost!

When you consider how many people make do with their versions of *Tasword*, or *Easiscript*, is it really worth paying ten to twenty times as much for something that, after extensive use, I can assure you is still a fairly average word processor?

As I understand it some professional business software writers regard CP/M as having been a positive hindrance to the development of quality software by encouraging a lowest common denominator approach.

In particular 16 and 32-bit 'wonder micros' have been forced to develop a pseudo CP/M standard of their own to satisfy business users who are keen to keep the software they are familiar with and want to avoid the problems of re-entering data files etc.

CP/M is becoming a bottom line standard perpetuating old technology in a way that many fear MSX will do.

In contrast, the chaotic non standard home computer scene has seen the arrival of software that has squeezed the very last drop out of the capabilities of the hardware — just look at some of the Spectrum programs coming out now.

People who are forced to run CP/M on their QL because of a shortage of software should feel cheated — the evolution to 16-bit (or is it 32?) has been phenomenally fast so why slam the brakes on now and start getting involved with an 8-bit standard?

As CP/M begins to look more and more arthritic to business users Digital Research will no doubt be delighted to see a new market opening up for in the low-end home computer sector.

Nevertheless, from Amstrad's point of view CP/M probably didn't look like such a bad idea.

After all, if you can find everything you need for your work on popular CP/M discs, why not run them on the best value hardware you can find? Besides which it plays games as well.

Tony Kendle

Leaf it out

Puzzle No 132

As is my usual practice when packing for the summer holidays, I always include an ample supply of reading matter in case of wet weather. There were a number of books that I had put ready and these are listed below (the figures in brackets after each title indicate the number of pages in the edition that I had).

1) The Rubaiyat of Omar Khyaam .... (64)
2) Twelfth Night by William Shakespeare ... (89)
3) The Shorter Poems of Wordsworth ... (107)
4) Tom Brown's Schooldays by Thomas Hughes .... (111)
5) Pygmalion by G B Shaw .... (147)
6) Wuthering Heights by Emily Bronte ... (168)
7) Sleeping Murder by Agatha Christie .... (179)
8) The Pickwick Papers by Charles Dickens .... (192)
9) 1984 by George Orwell .... (204)
10) War and Peace by Leo Tolstoy .... (241)

I am bound to say this this was the cause of some disagreement between my wife and I who felt that ten books was somewhat excessive. As a compromise I chose just five of the books but even so these provided me with a total of 800 pages.

Which books did I take?

Solution to Puzzle No 127

The total distance run was 280582 paces.

The program examines each integer from 1 to 1000 to see if it is a multiple of seven or 13 or to see if it contains any of the digits seven, one or three. Only if neither of these conditions apply is twice this distance added to the total (to account for the return journey).

```
10 LET DISTANCE = 0 20 FOR N = 1 TO 1000 30 IF N/7 =
INT(N/7) OR N/13 = INT(N/13) THEN GOTO 100 40 N$ =
STR$(N) 50 FOR F = 2 TO LEN(N$) 60 Z$ = MID$(N$,F,1)
70 IF Z$ = "7" OR Z$ = "1" OR Z$ = "3" THEN GOTO 100
80 NEXT F 90 DISTANCE = DISTANCE + (N*2) 100
NEXT N 110 PRINT DISTANCE
```

Winner of Puzzle No 127

The winner is B. A. Kidd of Holsworthy, Devon, who receives £10.

Rules

If the puzzle prize can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 132 is November 23.

The Hackers

You'll never dream a program could be this good!!!



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SIMPLE MINDED FUN FOR JADED, MIDDLE-AGED POLTROONS. DEVISED BY PIMAN GRAPHICS AND OFFENSIVE ADDITIONAL TEXT BY GREMLIN EVANS. ALL CHARACTERS © 1984 AUTOMATA UK LTD
9
YOU LOCATE THE GOLDEN SUNDIAL OF PI IN PIMANIA £6000 FOR ONLY A TENNER!
10
11
YOU GET PI-EYED ON £6
STAGGER ON
12
UNLUCKY FOR SOME - BUT NOT FOR YOU
DROP ONTO 32
13
YOU'RE CAUGHT PIRATING SOFTWARE AND GET CHUCKED OUT OF THE GAME
14
15
PAY £6 TO HELP MORRIS GET OUT OF THE CAR PARK MOVE TO 20
16
8
YOU MEET A PIMAN AT A FAIR. YOU BUY CRUSOE FOR ONLY £6 MOVE ON TO 10
7
OFFER WHOLESALE CREDIT... SUFFER CASH FLOW PROBLEMS BANK SAYS GO BACK TO 7
34
TURN UP ON THE WRONG DATE TO WIN THE GOLDEN SUNDIAL
33
GO TO JAIL PAY £6 AND MOVE DIRECTLY TO 35
32
31
GET WHOLESALERS TO PAY UP FRONT... ADVANCE TO 31
18
17
6
YOU PI-IN-'ERE MAIL-ORDER SERVICE £6 AWARDED TWO SQUARES
35
ORDER FORM
(THIS ISN'T PART OF THE GAME! THIS IS REALITY! ORDER YOUR UNMISSABLE GOODIES HERE, FOLKS!)
CRUSOE
PI EYED
PIROMANIA
PI IN ERE
YAKZEE
BACKCHAT
PIMANIACS CLUB
DEUS EX MACHINA
GO TO JAIL
MORRIS MEETS THE BIKERS
PIMANIA
OLYMPIMANIA
PI BALLED
DARTZ
NEW WHEELS JOHN?
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30
NEW WHEELS JOHN? ONLY A FIVER JOHN DRIVES YOU ROUND THE BEND TO 32 JOHN
19
CUT OUT THE DISCS AND PASTE ONTO CARD
THE PIMAN
5
STOP TO TALK TO LADY CLAIR THROW A 6 TO MOVE ON
START OWN SOFTWARE HOUSE THROW AGAIN AND GO TO SQUARE NUMBER SHOWN
36
29
DOUBLE TOP IN DARTZ A WINNER FOR 5 QUID! GO STRAIGHT TO SQUARE 24!
20
4
JUMP FROM BLAZING BUILDING IN PIROMANIA £6 HOSPITAL FEE BUT LAND ON SQUARE 40
37
28
YOU'RE BOWLED OVER WITH PI-BALLED AT ONLY £6 ROLL ON TO SQUARE 30
21
3
YOU BUY DEUS EX MACHINA FOR £15 MOVE DIRECTLY TO 8
38
27
YOU UPSET LURCH THE OFFICE PARROT (WELL, WE THINK HE'S A PARROT) AND HE CHASES YOU BACK 3 SQUARES
PI-DAY. π MOVE BACK TO 7.
22
2
TELEPHONE SALESPERSON TRYING TO SELL YOU ADVERTISING MAKES YOU MISS A TURN
39
26
23
1
THAT'S AUTOMATA'S PLACE SO MOVE ON 3 SQUARES ALREADY!
40
25
24
YAKZEE!
YOUR DISC ARE LOADED
IF EGOCENTRIC, USE SMALL ROUND PHOTO OF SELF
HOW TO PLAY 'THE PI IS CAST'. FIRST, IF PERMITTED SCISSORS, CUT OUT COUNTERS & DIE DISC. INSERT DUD MATCH THROUGH HOLE 'A' OF DISC (HOLE 'B' FOR 'LOADED' VERSION). PASTE THE LOT ONTO THIN CARD. NOTE THAT DIE IS UNUSUAL IN NUMBERING. FOR 'π' SYMBOL, SUBSTITUTE OWN AGE, BUT IF YOU GO PAST '40', CONTINUE COUNTING FROM SQUARE ONE.